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INVESTIGATIONS ON BACILLARY DYSENTERY IN INFANTS, WITH SPECIAL REFERENCE TO BACTERIOPHAGE PHENOMENA.[1]

By

F. M. BURNET,

MARGOT MCKIE

AND

I. J. WOOD.

(From the Walter and Eliza Hall Institute and the Children's Hospital, Melbourne.)

DURING the past summer a series of cases of diarrhœa in infants associated with dysentery bacilli in the fæces has been investigated. The primary aim of the investigation was to determine whether there was any relation between the appearance of active bacteriophage in the fæces and the clinical course of the disease. In addition the various dysentery strains obtained were classified according to the ordinary serological methods and studied in regard to their reactions toward bacteriophages. The infecting organism in the great majority of cases was a Flexner strain, usually of type W, but one Sonne and one Shiga strain were encountered.

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THE RÔLE OF BACTERIOPHAGE IN INFANTILE DYSENTERY.

The methods used were as follows. A small portion of fresh fæces was picked up with a sterile swab, muco-pus being taken if possible. This was emulsified in a tube of broth and plated on MacConkey's medium immediately. The tube was incubated overnight and the contents then filtered through a Seitz disc. The filtrates were tested on agar cultures of suitable organisms and when evidence of lysis appeared, a number of single plaques were tested for their specific type. Since a single phage particle in the presence of a sensitive organism can multiply to an unlimited extent under suitable conditions, it is difficult to devise a practicable technique for estimating the activity of phage in a given specimen of fæces. In the method used the appearance of a highly active phage in the filtrate can probably be taken as indicating either

an extremely high content of phage in the original material or the presence of dysentery bacilli and of an active phage capable of multiplying at their expense in the presence of numerous other organisms. The method is admittedly rough, but seemed the only one which would allow a number of infections to be continuously investigated without the use of a prohibitive number of filtrations. It is probable that the concentration of phage in the filtrate will give a fair estimate of the activity of bacteriophage in the intestinal contents at the time the specimen was obtained.

The filtrate was plated in successive dilutions on the homologous strain and on sensitive smooth (Y) and rough Flexner strains. From single plaques a trace of lysed material was picked up in a fine pipette and emulsified in a tube of normal saline. A small drop of this was then placed on four plates spread respectively with the strains Y (smooth), V (rough) and two rough strains specifically resistant to phages of groups C and D respectively. This allowed an immediate classification of the phages obtained into their types C, D, E or N. For the significance of this classification previous papers (Burnet, 1930, Burnet and McKie, 1930) may be consulted. The number of plaques tested for type depended on the appearance of the plaques. At least three of each distinct plaque type were tested. Table I shows the way in which the phage types are differentiated.

TABLE I.

Phage Type.	Strain.			
	Y Smooth.	V Rough.	Rough/C.	Rough/D.
C	+ or −	+	−	+
D	+ or −	+	+	−
E	+	−	−	−
N	+	+	+	+
NR	−	+	+	+

The N type which does not produce true resistant cultures, is the most active and is the type on which stress will be chiefly laid. The general results are incorporated in Table II. The phage content is expressed according to the type found and the

TABLE II.

The Appearance of Bacteriophages in Infantile Dysentery.

Case.	Age in Months.	Bacterial Type.	Outcome.	Duration of Fever (in Days).	Complications.	Phage Types Obtained.	Number of Specimens Examined.	Remarks.
1. Cases with +++ Homologous Phage.								
J.P.	14	W	R	8		N, D	8	
J.D.	22	W	R	8		N	4	
R.M.	16	VZ	R	17		D, N	6	
L.L.	6	W	R	About 60		C, N, D	21	Phage appeared only after relapse.
F.A.	18	W	D	8		N	1	Phage +++ on day before death.
J.Ph.	9	W and X	D	24		N, CR	5	Late appearance of new type of infecting organism.
2. Cases with Weak Homologous Phages only.								
A.E.	14	Z	R	35	Otitis	NR, N	3	
R.G.	13	W	R	16	Otitis	N, D	4	
N.F.	13	vZ	R	19		N	2	
H.H.	5	W	D	42		NR, D	7	
E.W.	19	W	D	24		N	4	
H.L.	3	W	D	23		D	4	
F.H.	7	W	D	28	Pneumonia	D	1	
M.B.	10	Z	D	15	Pneumonia	D	3	
3. Cases with No Homologous Phage.								
J.T.	16	W	R	24		D, E	11	
M.F.	20	W	R	15		N, NR	5	
E.Q.	19	W	R	16		Nil	2	
L.S.	16	W	R	19		DR, NR	4	
W.C.	6	VZ	D	17		Nil	6	
K.S.	3	wZ	D	23		Nil	7	
A.W.	16	W	D	19		Nil	2	Very heavy infection.

intensity of lysis on agar by a drop of the primary filtrate, +++ signifying confluent lysis, ++ a few hundred plaques and + a few isolated plaques. The cases are arranged in three groups, those showing at some period a highly active N phage, those with weaker homologous phages and those showing no homologous phages.

The series of twenty-one cases is too small for statistical treatment, but we may tabulate the relation between the presence of active phage (N type) and the outcome of the disease as follows:

TABLE III.

Outcome of Disease.	Cases showing			
	Active N Phages.			No N Phage.
	+++	+	Total.	
Recovered.. ..	4	3	7	4
Died	2	1	3	7

Before discussing the significance of the results obtained, it will be convenient to describe in more detail the six cases in which a highly active N phage appeared at some time during the illness. It is in these cases that the positive effect of bacteriophage on the disease should manifest itself if d'Herelle's hypothesis is correct.

CASE I.—J.P., a male, aged fourteen months, was admitted on February 9, 1930, with a history of diarrhœa and occasional vomiting for the previous two days. The diet prior to admission had been cow's milk and "light baby diet." On examination the child appeared only mildly ill. The rectal temperature was 38·3° C. (101° F.) and pulse rate 136. There was some splenic enlargement. The stools contained mucus with traces of blood.

The temperature subsided after three days in hospital and a liberal diet was soon instituted. The stools were very frequent at first and contained blood and muco-pus in diminishing quantities for twelve days. The child made a rapid and uneventful recovery and was discharged three weeks after the onset.

Clinically this was a case of Flexner dysentery with very marked pathological changes in the stools, but with very mild general symptoms and rapid recovery. The bacteriological findings are given in tabular form (Table IV), the number of days since the onset of the illness being shown for each examination. The numbers of colonies of dysentery bacilli found on MacConkey's medium are shown by + less than 10 per plate, ++ more than 10 per plate. The activity of the phage on the homologous organism is shown in the second row followed by its type. Where the type alone is given without indication of activity it signifies the presence of a phage acting on some strain of dysentery bacilli, but not on the homologous organism.

In this case an active phage was present on the first examination. Two days later, when the patient's temperature was subsiding, the phage was weaker and dysentery bacilli were absent. Thereafter neither dysentery bacilli nor phage was detected.

TABLE IV.

Showing Bacteriological Findings, Case I.

Observation.	Days Since Onset.						
	3	5	7	10	12	14	17
Dysentery bacilli	W++	–	–	–	–	–	–
Dysentery phages	+++ND	++D	–	–	–	–	–

CASE II.—J.D., a male, aged twenty-two months, was admitted on February 10, 1930. Twenty-four hours previously the illness began with a convulsion followed by drowsiness, vomiting and frequent motions. The stools were very offensive and contained blood just prior to admission. The diet had been cow's milk and light diet. On admission the temperature was 38·9° C. (102° F.), the pulse rate 140. The baby appeared very toxic and drowsy, but did not as yet show evidence of dehydration. A saline purge was given and a high carbohydrate diet with liberal amounts of fluid was commenced. At the onset the stools contained blood and muco-pus, but soon became more normal in frequency and character. After the first forty-eight hours in hospital the child improved rapidly and was discharged fourteen days after the onset of the illness.

Clinically this was a case of Flexner dysentery with a sudden and severe onset but a rapid recovery from the infection. The bacteriological findings are shown in Table V.

TABLE V.

Showing Bacteriological Findings, Case II.

Observation.	Days Since Onset.			
	1	3	5	10
Dysentery bacilli..	+W	1W	–	–
Bacteriophage ..	Not tested	+++N	+++N	–

As in the last case, the appearance of a highly active phage is associated with clinical improvement and disappearance of bacteria. Later the phage also disappears.

CASE III.—R.M., a male, aged sixteen months, was admitted on February 24, 1930, with an eight days' history of vomiting, anorexia and diarrhœa. The stools were green, very frequent and contained blood and muco-pus. On examination the child was moderately ill, showing a mild degree of dehydration, the rectal temperature was 38·3° C. (101° F.) and the pulse 160. In hospital the patient was moderately ill for about ten days, with a swinging temperature, occasional vomiting and frequent motions containing blood and muco-pus. The child then improved and was discharged twenty-eight days after the onset of the illness.

Clinically this was a typical case of Flexner dysentery of moderate severity. The bacteriological findings are shown in Table VI.

TABLE VI.

Showing Bacteriological Findings, Case III.

Observation.	Days Since Onset.					
	9	11	14	16	18	21
Dysentery bacilli ..	++VZ	++VZ	+VZ	–	–	–
Bacteriophage ..	D	+++N	D	–	–	–

In this case there was a very heavy infection and the active homologous phage was found on only one occasion some days before clinical improvement commenced.

CASE IV.—L.L., a male, aged six months, was admitted on February 3, 1930, with a history of seven days' diarrhœa with about twelve motions a day, containing slime but no blood. Diet prior to admission had been cow's milk and water. On examination the baby was well nourished and looked only moderately ill. There was no evidence of dehydration. The rectal temperature was 38·9° C. (102° F.) and the pulse rate 130.

In hospital the temperature did not exceed 37·8° C. (100° F.) and there were frequent liquid motions containing blood and pus. The child was only slightly toxic and showed a gradual improvement till five weeks after admission, when there was a definite relapse with the advent of marked toxæmia, temperature to 38·9° C. (102° F.) and vomiting. The stools which had been gradually improving, now became frequent again and pus and blood reappeared. This exacerbation lasted for two weeks. The infant then gradually recovered and was discharged from hospital seventy-three days after the onset of the illness.

Clinically this was a typical case of Flexner dysentery running a mild prolonged course until interrupted by a fairly severe relapse from which recovery was relatively rapid. The bacteriological findings are shown in Table VII.

This case is particularly interesting, showing first slow recovery with only traces of phage incapable of lysing the infecting strain, then a relapse with reappearance of dysentery bacilli in the fæces followed by an increasing activity of the homologous bacteriophage, recovery and a final disappearance of phage.

CASE V.—F.A., a female, aged eighteen months, was admitted on February 9, 1930, with a history of five days' illness, anorexia, vomiting and diarrhœa. The stools were very frequent, containing slime but no blood. Diet prior to admission had been unboiled cow's milk and "light baby diet." On examination the baby was very ill; the temperature was 39·4° C. (103° F.) and the pulse rate 145; cheeks were flushed and the lips cherry red; the child had air hunger, dry, inelastic skin and a slightly retracted abdomen.

In hospital the child was placed on a high carbohydrate diet and given liberal amounts of fluids, both orally and intraperitoneally. Muco-pus was present in the fæces and vomiting was severe throughout. The child became progressively worse and died eight days after the onset. Autopsy was refused.

In regard to bacteriological findings, only one specimen (obtained on the day before the child died) was examined. One colony of a W strain was obtained on plating and the filtrate proved to contain a highly active N phage lysing the homologous organism and all the other dysentery types tested.

Clinically this was a case of dysentery showing very gross toxæmia and rapid death. It demonstrates that a highly active bacteriophage may be present in an acutely fatal case.

CASE VI.—J.Ph., a female, aged nine months, was admitted on March 6, 1930, with a history of diarrhœa and vomiting for the past five days. Streaks of blood had been noticed in the motions. Diet prior to admission had been cow's milk and water.

On examination the baby did not look ill and took her feedings well. There was no evidence of dehydration and the prognosis appeared to be good. In hospital the motions became very frequent and contained much muco-pus and blood. Vomiting soon became a prominent feature of the illness in spite of vigorous treatment, and gradually led to a condition of great dehydration and toxæmia which eventuated in death twenty-four days after the onset.

The autopsy was performed by Dr. Reginald Webster to whose notes we are indebted for the following extract:

> The mucous membrane of the colon showed a general swelling of the lymphoid tissue and a fading hyperæmia. There were numerous small shallow ulcers. Very similar appearances were seen in the terminal ileum, but here there was no ulceration. The coats of the bowel were not œdematous and turgid as in the earlier stages of acute dysenteric inflammation.

The bacteriological findings are shown in Table VIII.

TABLE VIII.

Showing Bacteriological Findings, Case VI.

Observation.	Days Since Onset.				
	9	11	13	16	20
Dysentery bacilli	++W	+W	–	+X	–
Bacteriophage..	++N	+++N	–	N	C

Clinically this infection manifested a steadily progressive downhill course with nothing to suggest a change in the type of infection about the sixteenth day. An active bacteriophage was present on the ninth and eleventh days of illness, but it had disappeared with the next specimen and only weak heterologous phages were found thereafter. It should be noted that the X type strain was more sensitive to phages, including those obtained from this case, than the original W type strain. One cannot, therefore, interpret the change of type as due to the appearance of a phage resistant variant.

Discussion.

As is well known, d'Herelle (1926) claims that in such diseases as typhoid fever and Shiga dysentery the outcome is determined almost entirely by the activity of the bacteriophage which usually develops in these conditions. If an active phage appears, the bacilli are destroyed by it and convalescence occurs rapidly, but if no phage develops

Table VII.

Showing Bacteriological Findings, Case IV.

Observation.	Days Since Onset.															
	7	8	12	16	18	21	23	25	28–46	51	53	60	63	65	67	72
Dysentery bacilli ..	–	+W	–	–	–	–	–	–	All –	–	+W	–	–	–	–	–
Bacteriophage ..	–	–	–	–	–	C	C+N	N	All –	+N	–	+N	++CN	++ND	+++ND	–

or if the infecting bacilli are resistant to any phage that is present, then the disease proceeds to a fatal issue. Despite the obvious importance of this thesis, no satisfactory confirmation or refutation of d'Herelle's claim has appeared in the literature.

The present investigation must be regarded as to some extent confirming d'Herelle's point of view. It seems undoubted that the appearance in the fæces of a highly active phage which does not readily provoke resistant variants (N type) is generally of favourable import to the patient. In four out of six cases in which this occurred, defervescence occurred within six days from the appearance of the phage. The case of L.L. is particularly suggestive, the phage reactions being very similar to those of certain cases of Shiga dysentery described in d'Herelle's book.

On the other hand, four patients have recovered without our being able to detect homologous phage at any period, while two patients died despite the fact that at some period a +++ N phage was isolated from the fæces. In one of these latter the phage was detected in a single specimen taken when the patient was moribund and may have appeared too late to affect the patient's condition. With Case VI, however, an active phage appeared early and on d'Herelle's view the patient should have recovered, yet the course was steadily downward and a new type of organism, particularly sensitive to phage action, appeared shortly before death.

The influence of age on the outcome of the disease is rather strikingly shown in this series, the average age of the infants who recovered being 15·4 months, of those that died 9·6 months. Further, if we rearrange Table III to separate children over twelve months from those up to that age, we have Table IX.

TABLE IX.

N Phage.	Children, Three to Ten Months.		Children, Thirteen to Twenty-two Months.	
	Recovered.	Died.	Recovered.	Died.
+++	1	1	3	1
+			3	1
0		6	4	1

It is evident that the effect of the presence or absence of phage on the outcome is negligible in children over one year. The apparent influence of phage on the disease shown by Table III is entirely due to the fact that of eight infants under ten months six failed to develop an N phage and all died. We are thus left to determine whether the high mortality amongst the younger infants was due to their failure to develop an N phage or to their youth. If the lack of influence of phage on the disease in older children leads us to favour the latter alternative, it is still necessary to explain why eight out of thirteen older children developed N phages while only two out of eight younger ones did. The problem is an interesting one which we hope to study later.

On the basis of this investigation we can only offer very tentative conclusions as to the part played by phage in infantile dysentery. In children over twelve months of age bacteriophage appears to have no influence on the final outcome, but if a highly active N phage appears in the intestinal contents, convalescence is usually greatly expedited. In younger infants there is a much higher mortality and usually a failure to show an active phage in the fæces. Whether these two facts are directly correlated is not clear from the evidence. The only young infant in this series who recovered, showed a +++ phage just before a very delayed convalescence.

On the whole it seems probable that therapeutic administration of an active N phage to patients with infantile dysentery would shorten the period of illness and perhaps save a few lives. We hope to investigate this possibility during the coming year.

BACTERIOPHAGE REACTIONS OF LOCAL FLEXNER STRAINS.

In a recent paper (Burnet and McKie, 1930) the bacteriophage reactions of Flexner dysentery strains were discussed with special reference to the relationship between their antigenic structure and their phage sensitivity. It was found that in any group of antigenically similar strains all showed practically the same behaviour when tested with a series of phages. The present section deals with an extension of this work to recently isolated local Flexner strains and the results may be grouped under two main headings:

1. The relations between the serological type and phage reactivity of naturally occurring smooth Flexner dysentery strains.

2. The use of phages for the clinical identification of Flexner strains.

Relationship between Antigenic Type and Phage Reactions.

As described previously, phages active against Flexner dysentery bacilli fall into four groups. Members of one group (E) are active against smooth strains only, while members of the other three groups lyse all rough strains, but vary in their action on smooth strains according to the antigenic type of the latter. Representative members of each of these groups were used for the present investigation, the phages being as shown in Table X.

TABLE X.

C	D	E	N
5 18' 28	13' 3 4 17 22	6 8 21	12 13 19 20 31

These phages have all been previously described, with the exception of 31 which is a large plaque N type phage isolated from a case of Flexner dysentery (Case V, F.A.).

The strains investigated were all recently isolated from local cases, their phage sensitivity and antigenic structure being determined. The serological type of these Flexner strains was determined by the use of absorbed V, W and Z sera. The sera were prepared from rabbits immunized with the stock strains used in Andrewes's and Inman's work (1920) and were absorbed with washed bacteria of the two heterologous groups. In each serum the titre for the heterologous strains was reduced below 1:100, while for the homologous strains their titres were V 3,200, W 1,600 and Z 6,400 respectively. Fresh agar-grown emulsions of each strain were agglutinated with these absorbed sera and the titres obtained are included in the table.

The usual technique for the determination of phage reactivity was employed. A 1·5% agar plate containing a trace of gentian violet is spread with a young broth culture of the required strain, dried in the incubator and then a small drop of each phage is dropped on to a numbered area. The plate is incubated overnight and read. Table XI shows the reactions of twenty-six Flexner dysentery strains.

The table requires little explanation; it shows clearly that the reactions for a definite antigenic type are practically constant. The strains fall into four main groups which may be discussed separately.

1. W strains. This is by far the largest group, comprising about 70% of the strains studied. It is interesting to note that the strain M.F. which differs slightly serologically, since it contains some Z antigen, also differs slightly in phage sensitivity, being acted on by 21 and also weakly by 5 which do not attack pure W strains.

2. Strains predominantly Z. Four cultures fall into this group, only one of which, however, is a pure Z. Corresponding to the differences in antigenic structure of the other three strains, there are slight differences in phage reactivity. Some of these strains could probably be regarded as of Y type, but the Z component seems to predominate in both sets of characteristics.

3. VZ strains. This is a small but definite group. The phage sensitivity of a typical VZ strain is intermediate in character between that of a pure V or a pure Z. For instance, R.M. is like V and unlike Z in being unacted on by 18′, while it resembles Z in being acted on by 4 which does not attack pure V cultures. Again, phages active against both V and Z strains are also active against VZ strains (Table XII).

The case of W.C. requires some comment. Two strains were isolated at different periods and, as will be seen from the table, the first of these, judged by its phage reactions, belonged to type V, while the second, by the same criteria, was a Z strain. Yet both cultures were serologically identical, typical VZ strains. This affords an interesting commentary on the nature of the relation between

TABLE XII.

Strain.	Phages.		
	18′	4	6
V	–	–	+++
Z	+++	+++	+++
VZ	–	+++	+++

antigenic structure and phage reactions, which we hope to elaborate elsewhere.

4. Type X. This type is a rather ill defined one, showing, like Y, wide cross reactions with other strains. The strain J.Ph. 4, derived from a case which had originally given a typical W culture, showed the phage reactions of our stock X strain "Hughes." With the absorbed V, W and Z sera only the Z serum gave any agglutination (1:400). An X serum was absorbed with a large amount of Y culture and when tested gave the following titres: V 120, W < 40, X 1,280, Y 40, Z < 40, while J.Ph. 4 was agglutinated to a titre of 1:640. Finally, the power of J.Ph. 4 to absorb agglutinins from X and Z sera was tested with the results shown.

TABLE XIII.

Serum X absorbed J.Ph. 4.		Serum Z absorbed J.Ph. 4.	
Hughes X	80	Whittington Z	1,280
J.Ph. 4	<80	J.Ph. 4	<80

This strain is therefore extremely similar to Hughes X in its antigenic structure, though not completely identical, and must be classed as an X form.

The Use of a Series of Phages for the Clinical Identification and Typing of Flexner Dysentery Bacilli.

The correlation between phage sensitivity and antigenic structure suggested that a small series of phages could be used clinically for the recognition and typing of dysentery bacilli. It was found that a group of seven phages which included representatives of each of the four types, could be used to differentiate the various Flexner types. The table below (Table XIV) shows the results obtained by this method in the present investigation. Twenty-five Flexner strains and one each of Shiga and Sonne types are included. Figure I shows the result of testing V and W strains by the method on a single plate.

The technique is simple. A small portion of fresh fæces is emulsified in broth and the emulsion is plated on MacConkey's agar. After incubation likely non-lactose fermenting colonies are picked off, each being smeared over a quarter of an agar

TABLE XI.

Bacteriophage and Serological Reactions of Dysentery Strains.

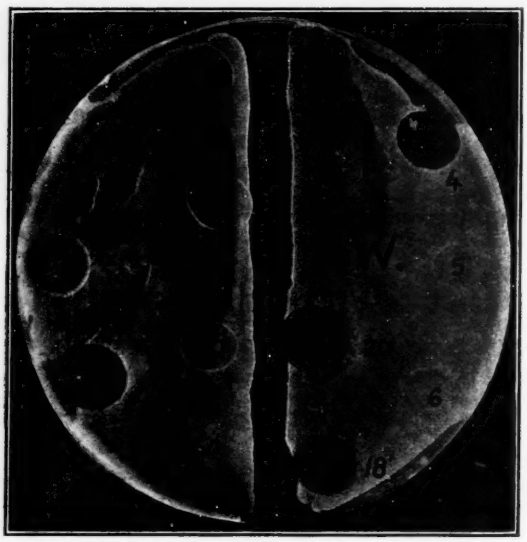
Strain.	Bacteriophages.																Agglutination Reactions.			Type.
	C			D					E			N					Serum.			
	5	18′	28	13′	3	4	17	22	6	8	21	12	13	19	20	31	V absorbed W, Z	W absorbed Z, V	Z absorbed V, W	
(i) (a) Flexner W (Cable)	−	+++	+++	−	+++	+++	++	+++	−	−	−	−	−	+++	+++	+++	<100	1,600	<100	W
F.A.	−	+++	−	−	+++	+++	++	+++	−	−	−	−	−	+++	+++	+++	<100	1,600+	<100	W
A.C.	−	+++	−	−	+++	+++	++	+++	−	−	−	−	−	+++	+++	+++	<100	1,600+	<100	W
E.F.	−	+++	−	−	+++	+++	++	++	−	−	−	−	−	+++	+++	+++	<100	1,600+	<100	W
R.G.	−	+++	−	−	+++	+++	+±	+++	−	−	−	−	−	+++	+++	+++	<100	3,200	<100	W
H.H.	−	+++	−	−	+++	+++	++	+++	−	−	−	++	−	+++	+++	+++	<100	1,600	<100	W
F.H.	−	+++	−	−	+++	+++	++	+++	−	−	−	−	−	±±±	+++	−	<100	1,600+	<100	W
L.L.	−	+++	+±	−	+++	+++	++	+++	−	−	−	+++	−	+++	+++	−	<100	3,200	<100	W
H.L.	−	+++	−	−	+++	+++	++	+++	−	−	−	−	−	+++	+++	+++	<100	1,600	<100	W
J.M.	−	+++	−	−	+++	+++	++	+++	−	−	−	−	−	+++	+++	+++	<100	3,200	<100	W
J.P.	−	+++	−	−	+++	+++	++	+++	−	−	−	−	−	+++	+++	+++	<100	1,600	<100	W
J.Ph.	−	+++	−	−	+++	+++	+±	+++	−	−	−	−	−	+++	+++	+++	<100	3,200	<100	W
E.Q.	−	+++	−	−	+++	+++	++	+++	−	−	−	−	−	+++	+++	+++	<100	1,600	<100	W
L.S.	−	+++	−	−	+++	+++	++	+++	−	−	−	−	−	+++	+++	+++	<100	1,600+	<100	W
J.T.	−	+++	−	−	+++	+++	++	+++	−	−	−	−	−	+++	+++	+++	<100	1,600	<100	W
A.W.	+++	+++	+++	−	+++	+++	+	+++	−	−	−	−	−	+++	+++	+++	<100	1,600	<100	W
E.Q.	−	+++	−	−	+++	+++	++	+++	−	−	−	−	−	+++	+++	+++	<100	1,600+	<100	W
(b) J.D.	−	+++	+++	−	+++	+++	++	+++	−	−	+++	−	−	+++	+++	+++	<100	1,600+	<100	W
M.F.	±	+++	+++	−	+++	+++	++	+++	−	−	+++	−	−	+++	+++	+++	<100	1,600	100−	Wz
(ii) Flexner Z	+++	+++	−	−	−	+++	++	+++	+	+++	−	−	−	+++	+++	+++	<100	<100	6,400	Z
(a) M.B.	+++	+++	−	−	−	+++	++	+++	+++	+++	−	+++	−	+++	+++	+++	<100	<100	6,400−	Z
K.S.	+++	+++	+++	−	−	+++	++	+++	+++	+++	−	+++	−	+++	+++	+++	<100	200+	3,200+	wZ
(b) A.E.	+++	+++	+++	−	−	+++	++	+++	+++	+++	−	−	−	+++	+++	+++	800+	400	3,200	vwZ
N.F.	+++	+++	+++	−	−	+++	++	+++	+++	+++	−	+++	−	+++	+++	+++	400	400−	3,200	vwZ
(iii) Flexner V	+++	−	−	−	−	−	++	+++	+++	+++	−	−	−	+++	−	−	3,200	<100	<100	V
W.C. (1) ..	+++	−	−	−	−	±±±	++	+++	+++	+++	−	−	−	+++	−	−	1,600+	<100	3,200	VZ
W.C. (5) ..	+++	+++	+++	−	−	+++	++	+++	+++	+++	−	+++	−	+++	+++	+++	1,600	<100	3,200	VZ
R.M.	+++	−	−	−	−	+++	++	+++	+++	+++	−	+±	−	+++	−	−	3,200	<100	6,400−	VZ
(iv) Flexner X (Hughes)	+++	+++	+++	−	+++ or −	+++	+++	+++	++±	++±	+++	+++	−	+++	+++	+++				
J.Ph. 4 ..	+++	+++	+++	−	−	+++	++	+++	+++	+++	+++	+++	−	+++	+++	+++	<100	<100	400	X

+++ = confluent uniform lysis. ±±± or ++± = confluent uniform lysis with more or less heavy secondary growth. ++ = almost confluent lysis, but with evidence of plaques. + = isolated plaques.

TABLE XIV.

Bacterial Types.	Phages.							Number of Strains Isolated.
	5	18′	3	4	6	21	20	
Flexner V	+++	−	−	−	+++	−	−	0
Flexner W..	−	+++	+++	+++	−	−	+++	16 pure W.
Flexner W (a)	−	+++	+++	+++	−	+++	+++	1 pure W, 1 with trace of Z.
Flexner Z	+++	+++	−	+++	+++	−	+++	1 pure Z, 3 with additional antigens.
Flexner VZ	+++	−	−	+++	+++	−	−	2
Flexner X..	+++	+++	−	+++	+++	+++	+++	1
Flexner Y..	+	+++	+++	+++	+++	+++	+++	0
Shiga	−	+++	−	+++	−	−	+++	1
Sonne	+++	+++	−	+++	− or +	−	+++	1

plate. A drop of broth is spread over each quadrant with a fine glass rod and the plate is dried off. Finally, a small drop of each phage is dropped on to a numbered area on each quadrant and the plate is incubated. The plate can be read after about six hours' incubation and the type determined by reference to the table. This method has proved



Reactions of V and W Flexner strains to the series of phages used for type differentiation.

very reliable in practice and in the great majority of cases gives clear-cut and easily read results. So far we have always found that the antigen indicated by the phage reactions is the dominant one when the strain is serologically tested. The greatest likelihood of error lies in the possible appearance of lysogenic, phage resistant or rough colonies on the fæcal plates. We have not in practice obtained such types on primary platings from fæces, but they have been reported and would undoubtedly give confusing results.

The group of phages used in the present work consists merely of those selected from a series of thirty-four phages which seemed most useful in differentiating the different types. It is undoubted that with more extensive material a simpler and more satisfactory set could be developed. Phages of group E which act only on the smooth strains, will probably be found most suitable for this type of work and at present we are endeavouring to develop a set of phages which, in addition to differentiating the Flexner types, will allow the recognition of Shiga and Sonne strains.

SUMMARY.

1. Bacteriophage capable of lysing the infecting bacillus frequently appears in the fæces of patients with infantile Flexner dysentery.

2. Active phages are much more frequently found in patients over twelve months of age than in younger infants.

3. The presence of highly active phage in some cases appears to determine a rapid recovery.

4. It is possible that the relative absence of phage in infants under one year is related to their very high mortality, but in older children the presence or absence of phage did not seem to influence the final outcome.

5. Further evidence of the relation between the antigenic structure and the phage reactions of dysentery bacilli is brought forward.

6. Two examples of change of type of infecting organism during the course of disease are described.

7. A method for the rapid typing of dysentery bacilli by the use of a series of phages is described.

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AN APPARATUS FOR RADIUM TELETHERAPY ON THE PRINCIPLE OF THE FERRIS WHEEL.

By WARNFORD MOPPETT, M.D., Ch.M. (Sydney),
Sydney.

WITH increasing amounts of radium available, attention has been turned to the possibilities of teletherapy on the lines of deep X ray therapy, as an alternative to the usual method of burying radium needles in the tissues.

Teletherapy is often applied to the placing of radium needles in a wax mould a few centimetres from the skin surface, but the term might be advantageously restricted to the radium "bomb" which is applied according to X ray technique. The essential problem is to deliver an effective dose to a deeply placed tumour by means of multiple ports of entry, so arranged that no one area of skin is injured by over-exposure.

As the supply of radium is relatively small, long exposures are required and in the interest of the operators it is advisable to employ some mechanical means for varying the port of entry. Knox devised such a method for X rays and recently Joly suggested that a radium bomb should be moved so that the incident beam described a conical surface with the tumour at the apex. Economy demands that more than one patient should be treated at a time and the radium bomb at the Westminster Hospital is so arranged that two patients are placed simultaneously above and below the source.

I am suggesting a mechanical device on the principle of the ferris wheel which provides for the simultaneous treatment of four patients and I think this provides the greatest economy which is practically available.

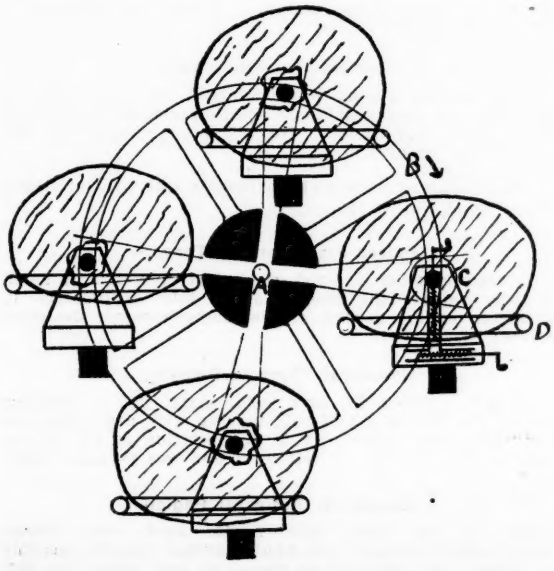

FIGURE I.

The principle will be apparent in Figure I, which is an end elevation, and Figure II, a plan of the apparatus. The radium is carried in a lead block, A, with four ports at right angles, provision being made for withdrawal into a protecting cavity when not in use.

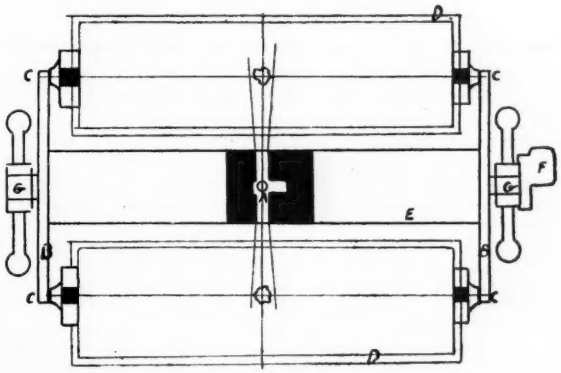

FIGURE II.

The lead block is supported in the centre of a tubular girder, E, flanked by large wheels, BB, the whole slowly rotating on the bearings, CC, by a geared motor, F.

Four weighted cradles are hinged to the wheels at the points marked C (two only are shown in the plan), so that they maintain four stretchers in a horizontal position. The stretchers are provided with lateral and vertical movements, so that the tumour, shown by irregular lines, may be placed where the emergent beam cuts the CC axis. Thus, as the apparatus rotates, the tumour will always be exposed to the rays, but the incident beam will describe a circular path round the skin of the patient.

Consider now some trial dimensions with the aid of a simplified Figure III, where r_1 is the distance

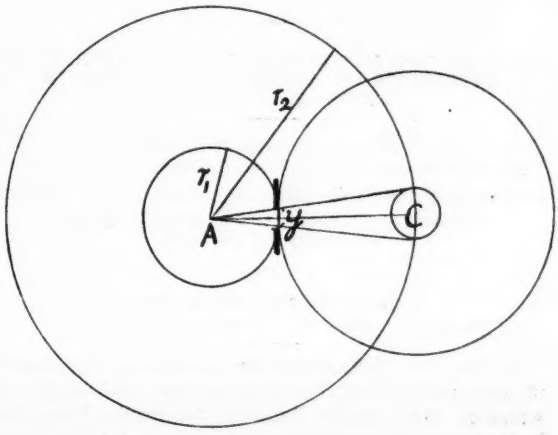

FIGURE III.

to the skin of the patient, r_2 the radius of the large wheel, y the diameter of the circle of skin irradiated at any instant, C the position of the tumour, and the circle about C represents the body of the patient.

Let I_y be the intensity at y and I_yT the erythema dose. The dose delivered at the point C will be:

$$TI_y e^{-\mu(r_2-r_1)} \times \left(\frac{r_1}{r_2}\right)^2 \quad \ldots\ldots\ldots\ldots\ldots (1)$$

allowing for the inverse square law and absorption in the tissues.

The dose delivered on any one area of skin passing y:

$$TI_y y/2\,\pi\,(r_2 - I_1) \quad \ldots\ldots\ldots\ldots\ldots (2)$$

For safety y must be such that (2) < (1).

Considering now some actual figures: When $\mu = 0{\cdot}15$ (water at 0·05 A°), $r_2 = 30$ centimetres, $r_1 = 15$ centimetres (the patient being $2(r_2 - r_1)$ or 30 centimetres diameter), also let the tumour be four centimetres in diameter, so that y = 2 centimetres and accordingly the port in the lead block (of radius ten centimetres) must be 1·3 centimetres with a correction for the finite diameter of the radium source, then (1) = $TI_y/40$ and (2) = $TI_y/47$ and the margin of safety 47/40 or 1·175/1.

(The emergent intensity is less than 1% of I_y, but internal scattering increases the effective depth dose by a factor of about three for a beam four centimetres across. This increases the safety margin.)

A few trial calculations will show that there is still ample safety when the tumour is eccentrically placed (Figure I) (simply let r_1 equal the distance from A to the skin for any given position), unless actually in contact with the skin, when the technique would be obviously unsuitable.

Although I have no personal experience of radium teletherapy, there appear to be no insuperable practical difficulties in the operation of such an appliance. A very slow rotation, such as one revolution in five minutes would not disturb the patients, preferably under the influence of a sleeping draught, and with a small supply of radium, say two grammes, the exposure could extend over several hours. Deliberately chosen ports of entry may represent the best practice, but they involve a considerable exposure of the operator and it does not seem serious if hard γ rays pass through the bones (or portion of the couch) during part of the path described by this apparatus.

NOTES ON THE PATHOLOGICAL LESIONS AND VITAL STATISTICS OF AUSTRALIAN NATIVES IN CENTRAL AUSTRALIA.

By J. BURTON CLELAND, M.D. (Sydney),
Marks Professor of Pathology, University of Adelaide,
H. KENNETH FRY, M.B. (Adelaide), B.Sc., D.P.H. (Oxon),
Lecturer in Therapeutics and Materia Medica, University of Adelaide,
AND
BRIAN GILMORE MAEGRAITH,
Student of Medicine, University of Adelaide.

IN August, 1929, under the auspices of the Board of Anthropological Research of the University of Adelaide and partly financed by funds from the Rockefeller Foundation administered by the Australian National Research Council, a visit was paid to Hermannsburg Mission Station in Central Australia, to study various aspects of the aboriginal, more particularly along the lines of physical anthropology, blood-grouping, mental ability and musical aptitude. During the course of our stay an outbreak of scurvy was studied and has been already reported on. The present notes give details of other conditions of medical interest recorded during our visit.

PART I: PATHOLOGICAL LESIONS.

Deeply Sunken Nose and Perforated Palate.

The following is the description of a patient with deeply sunken nose and perforated palate, due either to gangosa or tertiary syphilis.

Maria, aged *circa* fifty-five, had a deeply fallen-in nose with some scarring and a small rounded perforation of the palate. The lesions had quite healed. She had had a half-caste child and then three black ones. The nose had begun to disappear after her first child. One of the black children, now grown up, seemed quite healthy. The perfect teeth showed no sign of Hutchinson's congenital syphilitic central incisors.

The history suggests that the lesions may not be syphilitic, but perhaps due to gangosa.

Perforation of the Palate with Scarring.

A man, number 5, had a perforation in the centre of the hard palate with scarring of the soft palate and a perforation in this also. The back of the tongue was attached to the fauces on the left side. The anterior pillar on the right side was also attached to the tongue. His right eye had been destroyed.

Leucodermic Patches on the Palms.

Two men had extensive irregular leucodermic patches on both palms. One, number 44, had also leucodermic patches on the mucous membrane of the lower lip.

Circular Areas of Deeper Pigmentation.

One man had, scattered over the trunk and, more obscure, on the face, circular patches about the size of two-shilling pieces of deeper pigmentation. These had followed a number of crusted sores.

Enlarged Parotid Glands.

Both parotid glands were enlarged but quite soft in the case of a man, number 38, aged *circa* fifty. He said he had always had these. He did not complain of any dryness of the mouth.

The enlargements were probably due to distension from blockage of the ducts.

Raised Plaque on the Tongue.

A man, number 1, aged *circa* forty-five, had a small slightly raised pale plaque, about four millimetres in diameter, on the dorsum of his tongue towards the right lateral border.

Unilateral Thyreoid Swelling.

A man, number 27, aged *circa* sixty, had a swelling, nearly the size of a golf ball, moving with deglutition, on the right side, apparently in the position of the lateral lobe of the thyreoid. It felt tense and was perhaps cystic.

Lipoma in Temporal Region.

One of the men, number 45, aged *circa* thirty, had a soft, flattened, somewhat movable tumour, possibly a lipoma, not attached to the skin, just below the left temporal ridge.

Circumscribed Swelling Above the Clavicle from Carrying Logs.

A man, number 51, aged *circa* forty-five, had a circumscribed swelling above the clavicle from carrying logs. The swelling was due either to a bursa, a lipoma or fibrosis of the shoulder.

Many of the men who have done a lot of lumber carting for years, have developed pads of tissue upon the shoulder used in carrying. These tumours occur in the angle between the outer third of the clavicle and the anterior edge of the *trapezius*. The swelling is smooth, covered with normal skin, about the size of a hen's egg, firm, with the consistency of muscle, not cystic and apparently not translucent. The edge of the tumour is rounded, well defined and smooth. The skin can be pinched up over the swelling, but will not slide over it. Attachment to deep structures is loose. The whole tumour is movable 2·5 centimetres (one inch) each way. There is no tenderness and the swelling causes no inconvenience. The men always carry wood over the region of the swelling.

Gall Stone.

A man, number 31, aged *circa* thirty-nine, had been operated on a year ago in the Port Augusta Hospital and a gall stone had been removed.

Ulcerative Granuloma Pudendi.

Colin, a small boy aged four, was noticed to have difficulty in walking, having a shuffling gait and keeping the anal cleft with as little movement as possible. Inspection showed that in the gluteal cleft on each side there was a raised, fairly granular, plateau-like area of ulceration, its pink and white contrasting with the black skin. The lesion was 7·5 centimetres (three inches) long by 3·1 centimetres (one and a quarter inches) across. The posterior 1·8 centimetres (three-quarters of an inch) lay posterior to the anus, the rest crossing in front of it, resembling an inverted J. On the left the lesion was 3·7 by 2·5 centimetres (one and a half by one inch) and mostly posterior to the anal opening. The edges were abrupt and almost vertical and the lesion ceased at the anal margin. The condition was of no great inconvenience to the child, being neither tender nor painful.

This seemed to be an undoubted case of infective granuloma of the pudenda. There appeared to be no other persons similarly affected at the mission station, so it is difficult to understand how the patient had contracted the disease, if, as seems likely, its causative agent is conveyed more or less directly from patient to patient. It seems possible to exclude a venereal origin for it in this child.

Granulomatous Ulceration of the Nose and Lip.

Wantuna, aged twenty-five, had the right side of the nose irregularly scarred and partly scabbed and partly raw with coarse granular elevations. The upper lip below this area was scarred and somewhat infiltrated with slight nodular elevations. In the fold between the left ala and the cheek on the nasal aspect there was a smaller nodular and crusted patch. The teeth were sound and the buccal mucous membrane was healthy. She had a mucopurulent discharge from her left nostril. The granuloma had commenced on the right side of the upper lip two and a half months before she was observed.

Chronic Granulomatous Reaction with Scarring Round the Proximal End of the Subincised Portion of the Urethra.

An elderly man had had for many years a chronic inflammatory condition on the scrotal side of his subincised penis. At times it becomes very offensive with projecting granulations. At the time of our visit it was quiescent with a small area of ulceration and considerable scarring. The glands in both groins, especially the left, were slightly enlarged and shotty.

Retroversion of the Uterus in an Aboriginal Woman.

Minna, a full-blood aboriginal female, aged about twenty-two years, complained of pain in the lower part of the abdomen, especially on the left side, and pain across the small of the back. Her first child some years ago was half-caste. Three weeks previously she gave birth to her second child by an aboriginal father. The labour was difficult and the baby died in birth. Her complaint of pain dated from this time. The abdomen was slightly rounded, no palpable mass was present, there was no area of resistance to pressure and no tenderness. No perineal tear was present. On examination *per vaginam* no intravaginal cervix could be felt. The body of the uterus was extremely retroflexed and wedged almost upside down in the hollow of the sacrum. The retroflexion was converted to an anterior position, but no ring was available. The cervix still remained without intravaginal representation. On inspection through a speculum the cervix appeared as a small puckered opening in the vault of the vagina. No laceration had occurred. The mucosa of the vagina and inner surface of the *labia minora* and vestibule were of a uniform slaty grey colour, with the exception of a few irregular darkly pigmented patches, about one to three millimetres in diameter, in the vestibule. There were no pigmented patches in the vagina. After three days the patient stated that the pain had disappeared, so the anterior position of the uterus had probably been maintained.

Boomerang Injury to the Left Forearm.

A boomerang had hit the middle third of the forearm and broken the radius. The end of the bone had come out through the skin. The end of the bone had been pushed back and the wound was plastered over with cold ashes and bound up for a long time. They often put fresh ashes on a wound. At the present time the radius in the middle third presents an angulation of about 170°. There is no overgrowth of callus at the site of the healed fracture. The radius cannot be pronated more than half way and at rest adopts the position of semisupination. There is slight permanent subluxation of the ulna at the wrist. There is no affection of any movements of the wrist or elbow. The skin presents a narrow transverse scar five centimetres (two inches) long. The patient has also corneal opacities of both eyes, especially on the right side.

Old Fractures.

Number 7, a man, aged *circa* forty, had healed fractures of the right humerus, right patella and the fourth left digit.

Injuries of the Eyes.

Injuries to the eyes were very common and were attributed to burns from fire sticks and injuries from branches of trees *et cetera*. Some were probably the results of trachoma. Opacities of the cornea were numerous. A number of natives were blind; several of these had shrunken globes (*phthisis bulbi*).

Number 8, a man, aged *circa* forty, had an old healed ulcer of the right eye, about six millimetres in diameter, in the centre of the cornea, completely opaque, with vascularization on the nasal side.

Achondroplasia.

At Alice Springs, Mr. Smith, the Resident Engineer, kindly gave us a photograph (see accompanying figure) of an achondroplasic dwarf.

This man was a pure-blood, aged about forty-five years, who was employed at Betaloo Station, about fifteen miles east of Newcastle Waters in the Northern Territory. His mother had weighed about 148·6 kilograms (twenty-two stone). She had had apparently a large family. One brother seen was quite healthy. The dwarf was the "boss" of all the other natives on the station.

A pure blood achondroplasic aboriginal, aged forty-five, at a station in the Northern Territory.

Mental Deficiency.

Number 15, a male, aged *circa* twenty-four years, was mentally deficient. No other case was known in the family. He had a small head. Though idiolalic, he was able to point out the head, eyes and tail in a picture of a dingo. He was good tempered. He took part in ordinary camp life, but was teased by the children. He was stated to masturbate publicly.

Test to See if an Enemy is Dead.

To see whether an enemy is dead, the point of a spear is thrust into the anus. If there is no resistance in the anal sphincter, the man is dead. (Note that in laying out a body the nurse inserts a cotton wool plug into the anus to prevent the relaxation of the sphincter in death letting the rectal contents escape.)

PART II: VITAL STATISTICS.

During our visit the records of births and deaths of natives at the Mission were made available by the courtesy of the Principal, the Rev. F. W. Albrecht. The following tables have been compiled from these records and are of some interest, even though they do not represent complete vital statistics, because they are probably the most reliable figures that will ever be obtainable concerning the life and death of aboriginals living under conditions of or closely approximating to their native state.

The majority of the people concerned belong to the Aranda (Arunta) Tribe, but some belong to the neighbouring Loritja Tribe. Half-castes have been excluded from the statistics, but it is found impossible to weed out three-quarter castes, so a few of these are included.

Table I is from the record of burials at the Mission from 1879 to 1928. All records of aborigines are given, with the age at death. Males are indicated by the plain figure of age; an asterisk is placed against the age figure in the case of females.

Year of Death.	Age at Death. Months.	Age at Death. Years.	Number of Those Whose Age was Unrecorded.
1888		1	
1899		4* 7* 7*	
1891	8*		
1893		4	
1895			1
1896		11	1
1897	10*	1* 1*	
1898	4*		
1899	1* 9	18 41*	
1900	1 1 4	4	
1901	1		
1904	1 1		
1906	1* 9	1	
1907	1 1 4		
1908	1	1*	
1909	1*	3*	
1910	1* 5* 6* 10	50	1
1911		1 1 21 50*	2*
1913	4*	36* 48	
1914	1	2* 61*	
1915	4*	1	
1916	9	1	
1917	1*		
1918	1* 8*		
1919		43	
1920	7	1* 16	
1921	2* 7*		
1922	4*	40	
1923	6	45 61	
1924	11	1 12 12 18 48 50 51 60* 80	
1926	2* 3* 4* 5 9* 11*	1* 31 48 54* 56 56	
1927	3 7 9*	1 13 27 42*	
1928	3 6* 7* 8*	1* 1* 4* 6 24*	

In fourteen cases a cause of death is stated. These details are given later. The heavy mortality in 1924 and 1926 is attributed to influenza, that of 1928 to whooping cough. Unfortunately no population figures are available.

Summarized, the data above show that there have been buried during the period under record:

Under 1 year ..	22 males,	26 females.	Total 48.
1 to 2 years ..	8 males,	8 females.	Total 16.
3 to 5 years ..	2 males,	3 females.	Total 5.
6 to 10 years ..	1 male,	2 females.	Total 3.
10 to 20 years ..	7 males,	0 females.	Total 7.
20 to 30 years ..	2 males,	1 female.	Total 3.
30 to 40 years ..	2 males,	1 female.	Total 3.
41 to 50 years ..	7 males,	3 females.	Total 10.
51 to 60 years ..	3 males.	2 females.	Total 5.
61 to 70 years ..	1 male,	1 female.	Total 2.
71 to 80 years ..	1 male,	0 female.	Total 1.
Total	56 males,	47 females.	Total 103.

A second source of information consisted of a book of family records of the family Bible type drawn up by the late Rev. C. Strehlow. Records of forty-two families are represented. The entries date from 1879 to 1923. It is probable that there are omissions in earlier years, as these years preceded Pastor Strehlow's association with the Mission. Young children dying before the Pastor's time are probably not recorded in all cases. The

following statistics, culled from the records, should not be, however, very far from the actual state of affairs:

(1) Size of families:

In 8 families the number of children was 0 = 0 children.
In 4 families the number of children was 1 = 4 children.
In 4 families the number of children was 2 = 8 children.
In 6 families the number of children was 3 = 18 children.
In 1 family the number of children was 4 = 4 children.
In 3 families the number of children was 5 = 15 children.
In 5 families the number of children was 6 = 30 children.
In 2 families the number of children was 7 = 14 children.
In 3 families the number of children was 8 = 24 children.
In 3 families the number of children was 9 = 27 children.
In 3 families the number of children was 10 = 30 children.

Total, 42 families, 174 children. Average 4·2.

(2) Proportion of sexes: Of these 174 children 94 were males, 78 females, unrecorded 2.

(3) Prevalence of twins: Three cases of twins are recorded. Two cases in one family were one male, one female. A third case is only mentioned with the remark that both were killed after birth.

(4) Age of parenthood: The youngest mother recorded was (?) 15; the oldest (?) 51. The oldest presumptive father (?) 55 years.

(5) Season of birth: Of 152 recorded birthdays there were in:

January	13
February	10
March	20
April	12
May	15
June	15
July	10
August	9
September	8
October	14
November	12
December	14

(6) Intervals between births: In 121 cases where data were available—

In 3 cases there was an interval of 11 months. In each of these cases the previous baby died within a week of birth.

In 12 cases there was an interval of 12 to 14 months. In 7 previous baby died under 14 days; in 1 previous baby died at 3 months; in 1 previous baby died at 6 months; in one previous baby died at 7 months; in 2 previous baby living.

In 9 cases there was an interval of 15 to 18 months. In 3 previous baby died under 1 month; in 2 previous baby died at 3 months; in 1 previous baby died at 6 months; in 1 previous baby died at 9 months; in 2 previous baby lived.

In 14 cases there was an interval of 19 to 24 months.
In 21 cases there was an interval of 25 to 30 months.
In 27 cases there was an interval of 31 to 36 months.
In 22 cases there was an interval of 3 to 4 years.
In 3 cases there was an interval of 4 to 5 years.
In 6 cases there was an interval of 5 to 6 years.
In 2 cases there was an interval of 6 to 7 years.
In 2 cases there was an interval of 7 to 8 years.
Over 8 years, nil.

(7) Mortality: Of the 174 children recorded, the following are reported to have died:

Under 1 year: 28 males, 18 females, 2 sex not recorded. Total 48, including 2 male still-born.
1 to 5 years: 3 males, 7 females. Total 10.
6 to 10 years: 0 males, 2 females. Total 2.
11 to 20 years: 2 males, 1 female. Total 3.
Over 20 years: nil.
Total 63.

Of the forty-eight babies dying under one year of age, the month of death was:

	Cases.
January	1
February	1
March	9
April	9
May	3
June	4
July	1
August	4
September	6
October	0
November	2
December	4
Unrecorded	4

These figures include one still-birth in April and one in September. Of these same 48 babies there died under one month: 18 males, 9 females and 2 sex unrecorded. Total 29.

Extracts from Burial Notices in Hermannsburg Register.

We conclude by giving some extracts from burial notices in Hermannsburg Register. In most cases the cause of death is not mentioned. The following records appear, but the diagnosis in each case is by a layman.

1913: Johanna, 36 years. Retained placenta. (This woman had been married twenty years and was childless. She was given medicine by a missioner, conceived shortly after, but died after parturition, to the missioner's distress.)
1913: Isaak, 48 years. Unhealed wound two years.
1920: Heinrich. Influenza.
1923: Walter, 61 years. Locomotor ataxia. (A witness stated this man was dead from the waist down before death, so a myelitis is a more probable diagnosis.)
1924: Abraham, 80 years. Pneumonic influenza.
1924: Phillip, 50 years. Influenza.
1924: Renaka, 60 years. Heart failure.
1924: Jonas, 13 years. Bronchitis and pleurisy.
1924: Stephanus, 18 years. Cancer of the stomach. (This diagnosis can hardly be correct.)
1927: Theodora, 13 years. Infantile paralysis (? chorea).
1927: Ella, 42 years. Cancer of the breast.
1928: Edna, 4 years. Granuloma.
1928: Amos, 6 years. Bronchitis.
1928: Justina, 1 year. Pneumonia.

ECLAMPSIA AND THE RESULTS OF LIVER THERAPY.

By R. FRANCIS MATTERS, M.D., F.R.C.S. (Edinburgh),
Lecturer in Human Physiology, University of Adelaide; Tutor in Obstetrics, Queen's Home, Adelaide.

THE investigation of preeclamptic conditions in a large series of patients resulted in the conclusion that there might be some correlation between the epigastric pain in these persons and the epigastric pain so frequently found in patients with pernicious anæmia. Bourne[1] considers that many cases of puerperal mania are preceded by eclampsia and it has been indicated[2] that cases have occurred in which eclampsia has been followed *post partum* by mania and pernicious anæmia. Galloway[3] has found that a large number of women develop anæmia during pregnancy. It is quite possible that many of these are early candidates for eclampsia.

It would appear also that there is sometimes a blood calcium alteration in eclampsia and that a

recurrence of convulsions in the puerperium is probably due to tetanus. The blood calcium content of both pernicious anæmia and eclampsia is subnormal, but this condition also occurs slightly in the latter months of a normal pregnancy.[4]

The earlier association of eclampsia and anæmia and the further relationship of an altered calcium function gave rise to the possibility of dysfunction of hormones. It was therefore decided to apply to preeclamptic and eclamptic states the liver hormone, because it has been abundantly shown ever since Minot and Murphy first published their original results, that the toxæmic state which obtains in pernicious anæmia is completely eliminated by the administration of liver and the entire human organism is reestablished as a normal being.

The amount of investigational work conducted upon these researches has been so limited that these statements are offered merely as possibilities and in the hope that others might become imbued with a desire to discover whether this treatment is a satisfactory method of attacking eclampsia. The patients have been so few that the selection has been most limited, but the results have been eminently satisfactory, especially so in preeclamptic conditions of high blood pressure, œdema, visual disturbances and albuminuria.

Liver has been administered in the form of extract and the extract used was that supplied by Parke, Davis and Company. The amount given has been approximately equivalent to 240 grammes (eight ounces) of the fresh liver *per diem* and is given in four doses throughout the day.

In antenatal cases the preeclamptic patient is completely rested in bed and the diet is restricted to milk foods and fruit juices. Eliminative treatment is then instituted and liver extract equal to 180 grammes (six ounces) of fresh liver is given daily.

True eclamptics are kept quiet in a darkened room and are given eliminative treatment. The stomach also is washed out until the fluid returns clear and then the equivalent of 120 grammes (four ounces) of fresh liver is introduced through the stomach tube. "Karna Vita" has been used in two cases, but did not give results equal to those obtained with the Parke, Davis extract.

One case which might be recorded, was that of a *primipara*, aged forty-two years.

At term this patient had a convulsion and, when seen shortly afterwards, the systolic pressure was 196 millimetres of mercury and the diastolic 112 millimetres. The vision was blurred and there were small retinal hæmorrhages. The urine had a heavy cloud of albumin and there was general œdema. Liver extract was administered and the patient was delivered with forceps, this being considered necessary owing to her exhaustion and because of the convulsions. Shortly after this the systolic blood pressure became 130 millimetres of mercury with a diastolic pressure of 83 millimetres. The œdema quickly cleared up and the albumin disappeared from the urine.

This work was begun as an independent research and was thought to be the only investigation directed along these lines. It has been found, however, that Miller and Martinez,[5] of Pittsburgh, have been following the same line of thought, but their administration of the liver has been intravenously.

Conclusions.

1. The cases treated gave results which were better than those normally obtained.
2. No fatal case occurred in this series.
3. Liver treatment might be given in antenatal conditions when early indications are found.
4. Intravenous administration would offer great assistance in the treatment of a bad eclamptic.
5. Nephritic conditions with œdema and high blood pressure do not offer the same possibilities with liver treatment.
6. The immediate action of the treatment is probably *viâ* the depressor effect, but subsequently the result is due to elimination of the cause of the toxæmia.
7. The general treatment is that used at the Rotunda Hospital, the liver being the only difference. It is possible, therefore, that the results are not entirely due to the liver *per se*, but may be largely the result of elimination. It is considered, however, that the liver is the factor which has produced such good results.

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PERSISTENT NASAL DISCHARGE AND CHEST COMPLICATIONS IN CHILDREN DUE TO INFECTION OF THE MAXILLARY SINUSES: STATISTICAL REPORT.

By J. PARKES FINDLAY, M.B., Ch.M.,
Honorary Assistant Aural Surgeon, Sydney Hospital.

FOLLOWING my preliminary report on persistent nasal discharge and chest complications in children due to infection of the maxillary sinuses which appeared in this journal on January 4, 1930, I am now able to publish the clinical figures of patients treated over a period of twelve months obtained at my clinic in the Ear, Nose and Throat Department, Royal Alexandra Hospital for Children, 1929 to 1930.

TABLE I.

Number.	Age.	Symptoms.		Examination of Chest.		Organisms found on Pathological Examination of Nasal Discharge.[1]	Complicating Conditions or Abnormalities.	Results After Operation.	Other Remarks.
		Duration of Bilateral Nasal Discharge.	Duration of Cough.	Physical Signs.	X Ray Findings.				
Males.									
1	7½	3 months	2 months	Nil.	No changes.	A. B.	Bilateral *otitis media*	No nasal discharge, no cough.	Pertussis and measles.
2	6	3 years	2½ years	Râles, rhonchi, asthma.	Marked bronchitis, ? bronchiectasis.	A. B. C.	Nil	No nasal discharge, cough relieved, asthma slight.	"Lipiodol" picture normal.
3	12	Mostly post-nasal	?	Nil.	Nil.	A.	Nil	No nasal discharge, no cough.	
4	9	4 years	3–4 years	Rhonchi.	Slight bronchitic changes.	A. C.	Nil	No nasal discharge, no cough.	
5	5½	1½ years	1 year	Rhonchi +.	Bronchitic changes.	B. C.	Left *otitis media*	Nose dry, slight cough.	Pertussis.
6	9	6–7 years	5 years	Nil.	Slight bronchitic changes.	A. B.	Nil	Nose dry, cough relieved.	
7	5	2 years	2 years	Rhonchi.	Bronchitic changes.	C. B.	Nil	No cough, nose dry.	Pertussis and measles.
8	11	? years	? years	Nil.	Slight changes.	D.	Nil	No discharge, cough relieved.	
9	7½	2 years	6 months	Nil.	Bronchitis.	B. D.	Nil	No nasal discharge, no cough.	
10	7	4 years	3 years	Nil.	Bronchitis.	A. B.	Nil	No nasal discharge, slight cough.	
11	12½	1½ years	1 year	Nil.	Slight bronchitis.	C.	Nil	No nasal discharge, no cough.	
12	4½	1½ years	1 year	Rhonchi.	Bronchitic changes.	A. D.	Nil	No nasal discharge, cough slight.	
13	9	7 years	5 years	Râles, rhonchi.	Bronchitis.	A. B. D.	Nil	No nasal discharged, cough relieved.	
14	11	? years	? years	Rhonchi.	Bronchitis.	B.	Nil	No nasal discharge, cough relieved.	Pertussis and measles.
15	10	3 years	? years	Nil detected.	Bronchitic changes.	B.	Nil	No nasal discharge, no cough.	
16	7	1 year	9 months	Nil.	Bronchitic changes.	C. D.	Nil	No nasal discharge, no cough.	
17	9	6 years	5 years	Râles.	Bronchitic changes.	A. B.	Nil	No nasal discharge, no cough.	
18	9	1 year	9 months	Slight rhonchi.	Bronchial changes.	C. D.	Nil	No nasal discharge, no cough.	
19	11	2 years	2 years	Rhonchi.	Bronchitis.	B. D.	Nil	No nasal discharge, cough relieved.	
20	4	3 years	2 years	Râles, rhonchi.	Bronchitis.	C.	Bilateral *otitis media*	No nasal discharge, cough slight.	
21	11	2 years	1 month	Nil.	Nil.	A.	Nil	No nasal discharge, no cough.	
22	7	5 years	3 years	Rhonchi.	Bronchitic changes.	B. A.	Nil	No nasal discharge, cough relieved.	
23	6	1 year	9 months	Nil.	Bronchitic changes.	D.	Nil	No nasal discharge, no cough.	
Females.									
24	5	?	?	Rhonchi.	Bronchitic changes.	A. D.	Nil	No nasal discharge, cough relieved.	
25	8	1½ years	6 months	Nil.	Bronchiectasis.	A. B.	Nil	No nasal discharge, cough relieved.	"Lipiodol" picture doubtful; pneumonia.
26	7	1½ years	1 year	Nil detected.	Slight bronchitic changes.	B. D.	Nil	No nasal discharge, no cough.	
27	10	6–7 years	5 years	Rhonchi.	Bronchitic changes.	C. D.	Nil	No nasal discharge, cough relieved.	Pertussis.
28	11	4 years	3 years	Nil.	Bronchitic changes.	A. B.	Nil	No nasal discharge, cough relieved.	
29	8	3 years	3 years	Rhonchi.	Bronchitic changes.	A.	Nil	No nasal discharge, slight cough.	
30	12	5 years	5 years	Râles, rhonchi.	Bronchitic changes +.	B. A. D.	Nil	No nasal discharge, cough relieved.	Pneumonia and pertussis.

[1] Pathological organisms: A. = Pneumococci. B. = Diphtheroid group. C. = *Staphylococcus albus*. D. = Gram-negative cocci and diplococci.

TABLE I (*Continued*).

Number.	Age.	Symptoms.		Examination of Chest.		Organisms found on Pathological Examination of Nasal Discharge.[1]	Complicating Conditions or Abnormalities.	Results After Operation.	Other Remarks.
		Duration of Bilateral Nasal Discharge.	Duration of Cough.	Physical Signs.	X Ray Findings.				
31	6	4 years	4 years	Rhonchi.	Bronchitic changes +.	A.	Nil	No nasal discharge, slight cough.	Pertussis, asthma last six months.
32	8	4 years	3 years	Nil.	Bronchitic changes.	C. B.	Nil	No nasal discharge, no cough.	
33	4	3 years	2 years	Râles, rhonchi.	Bronchiectasis.	A.	Nil	No nasal discharge, cough improved.	"Lipiodol" picture doubtful; pertussis and pneumonia.
34	10	6 months	6 months	Rhonchi slight.	Bronchitic changes.	C. B.	Nil	No nasa discharge, no cough.	
35	9	1½ years	1 year	Nil.	Bronchitic changes.	A.	Nil	No nasal discharge, no cough.	
36	4½	1½ years	1 year, sputum +.	Râles.	Bronchiectasis.	A.	Bilateral *otitis media*	No nasal discharge, cough relieved.	"Lipiodol" revealed slight cavitation.

[1] Pathological organisms: A. = Pneumococci. B. = Diphtheroid group. C. = *Staphylococcus albus*. D. = Gram-negative cocci and diplococci.

During this period 600 new patients were examined. Of this number 40 or 6·6% were suffering from the above infection; 23 were males or 57·5% and 17 females or 42·5%. In the accompanying table the histories of only thirty-six patients are published in detail, the remaining four patients' cards were incomplete. The intranasal antrostomy was performed on all these patients, their tonsils and adenoids having been previously removed.

Proof Puncture of the Maxillary Sinuses in Children.

During the past twelve months I have punctured the antra *viâ* the inferior meatus in all patients and have not experienced any difficulty, notwithstanding that statements have been made by authorities that there is grave danger in this procedure.

From my observations and measurements of the maxillary sinuses in the dried skulls of children up to ten years of age I am certain that there is no danger in puncturing the sinuses *viâ* the inferior meatus, provided care is taken. It is imperative that the site of puncture should be at the highest point of the inferior meatus on account of the variation of the relationship between the floor of the inferior meatus and the floor of the maxillary sinus. This difference is important, both for proof puncture and operative technique. The following statement shows the relative differences according to ages:

At two and a half years the floor of the maxillary sinus is 5 millimetres above the floor of the inferior meatus.

At three years the floor of the maxillary sinus is nearly 5 millimetres above the floor of the inferior meatus.

At three and a half years the floor of the maxillary sinus is 4 millimetres above the floor of the inferior meatus.

At three years and ten months the floor of the maxillary sinus is 3·75 millimetres above the floor of the inferior meatus.

At five years the floor of the maxillary sinus is 3·0 to 3·5 millimetres above the floor of the inferior meatus.

At six years the floor of the maxillary sinus is 3 millimetres above the floor of the inferior meatus.

At eight years the floor of the maxillary sinus is nearly 3 millimetres above the floor of the inferior meatus.

At ten years the floor of the maxillary sinus is 2·5 to 3·0 millimetres above the floor of the inferior meatus.

In puncturing the maxillary sinus in children an important fact to be borne in mind is that the trocar should be directed towards the centre of the lower orbital margin, not towards the outer canthus of the eye, as the medio-lateral measurement of the maxillary sinus is considerably less than the ventro-dorsal. In the medio-lateral plane there is very little space, hence it is probable that if the trocar is directed too laterally it will penetrate the outer wall of the sinus and pass into the soft tissue of the cheek or into the outer part of the bony orbit.

To emphasize the above, the measurements of the maxillary sinus prove very interesting. In Table II I have adhered to Schaeffer's planes of measurement of the maxillary sinus, that is, cephalo-caudal (height), ventro-dorsal (length), medio-lateral (width).

TABLE II.

Age in Years.	Ventro-dorsal Measurement in Millimetres.	Cephalo-dorsal Measurement in Millimetres.	Medio-lateral Measurement in Millimetres.
2½	22	11	9
3	22 to 23	11 to 12	9 to 10
3½	23·5	12	10
3 10/12	24	12	10
5	26 to 27	15 to 16	15 to 16
6	27 to 28	16 to 17	16 to 17
7	28	17	17 to 18
8	28 to 29	17·5	18
10	30	18	20

Proof puncture *viâ* the canine fossa up to the age of nine years is not without risk, however excellent the technique or anatomical knowledge, as injury to the dental sperms of the second dentition may result following this procedure.

The area for penetration into the maxillary sinus through the canine fossa is very limited, as the unerupted canine first and second bicuspids occupy the space above the alveolus extending to within a few millimetres of the infraorbital foramen.

Operative Technique.

For permanent and good results from the intranasal operation on the maxillary sinuses in children the opening under the inferior turbinate must be large and the antro-nasal wall removed posteriorly as far as the vertical part of the palate bone. This I found to be absolutely necessary to insure permanency of the opening. The floor of the anterior portion of the sinuses is well above the floor of the inferior meatus; this is due to the floor of the sinus rising above the unerupted canine and first bicuspid. As the floor of the sinus extends posteriorly, it gradually becomes level with the floor of the nose. If the opening is limited to the immediate anterior extremity of the sinus, it will close within a few weeks.

In all the patients operated upon the inferior turbinate was fractured upwards and inwards to give room in order to remove the antro-nasal wall posteriorly and then replaced to its original position at the finish of the operation.

I have come to the conclusion that immediately the antral infection is diagnosed, the antra should be opened and drained *viâ* the nasal route at once; this relieves the chest condition and the final results are more satisfactory.

The results obtained indicate that early operative interference was justified in all patients, in many curing the sinus infection and cough and in others relieving their long-standing cough and preventing further lung changes.

Acknowledgements.

I desire to thank Professor Burkitt, of the Medical School, for placing at my disposal the series of children's skulls in the Anatomy Museum. Also Dr. Wilfred Evans for his physical examination of the chest in all the patients and carrying out the "Lipiodol" tests, and also the staffs of the Pathological and Radiological Departments of the Royal Alexandra Hospital for Children for their pathological and radiographic reports.

Reports of Cases.

RODENT CARCINOMA OF THE NECK, WITH PENETRATION OF THE LUNG AND SPINAL CANAL.

By RUPERT A. WILLIS, M.D. (Melbourne),
Medical Superintendent, Austin Hospital for Chronic Diseases, Heidelberg, Victoria.

BECAUSE the face and scalp are the favourite sites of origin of rodent carcinoma, the deep destructive properties of this tumour are seen most frequently involving the facial and cranial skeleton and viscera. Rodent ulceration in other and less usual regions, however, may effect similar extensive tissue destruction and may penetrate important subjacent viscera. Such an event is exemplified in the following unusual instance of rodent cancer of the shoulder.

Clinical History.

In 1908 a single woman, then thirty-five years of age, first noticed a small flat growth in the skin of the left shoulder region. This enlarged very slowly and was neglected for several years. Eventually, however, it began to cause pain in the scapular region and arm and the patient attended a public hospital where the tumour was treated by excision and diathermy. The wound healed, but later ulcerated again and small areas of recurrent growth developed at the ulcer margins. On several occasions thereafter excision of the recurrent growth was performed and numerous applications of radium and deep X ray therapy were made; but on each occasion the wound, though temporarily improved, broke down again and underwent further extension. The last excision was performed in November, 1927, and the last radium application was made in May, 1928. The patient was admitted to the Austin Hospital in July, 1928.

Examination on admission disclosed extensive scarring of the acromial and supraspinous regions, with two areas of superficial ulceration, exposing the border of the *trapezius* muscle and extending from the acromion laterally to nearly the sterno-mastoid line medially. The adjacent tissues were infiltrated and exhibited pronounced hyperæmia and hyperæsthesia. Save for bony ankylosis of the right elbow dating from a subacute arthritis in early life and the scars of some childhood burns on the limbs, general examination disclosed no other clinical abnormalities. The Wassermann test yielded no reaction.

The patient's subsequent progress was one of steady decline. She suffered much pain in the shoulder and neck and had frequent attacks of vomiting. The ulcerated areas slowly extended and deepened. A section taken from the edge of the ulcer in December, 1928, revealed the characteristic structure of rodent carcinoma. In April, 1929, the ulceration had extended nearly to the mid-line posteriorly; it was deepest in the supraspinous and supraclavicular areas and in the last situation its base could be seen to move with respiration, evidently adhering to the apex of the lung. The patient died in June, 1929. Her age at death was fifty-five years and the tumour had been present for twenty years.

Autopsy Findings.

The large ulcerated area over the left side of the neck and shoulder exposed the acromion and spine of the scapula, almost the entire length of the clavicle and the spinous processes of the second, third and fourth cervical vertebræ. The growth penetrated the interval between the laminæ of the third and fourth vertebræ and the spinal canal was perforated at this point. A probe passed freely into the canal for a short distance both cranially and caudally and this procedure liberated a small quantity of purulent *débris*.

The apex of the left lung was adherent to and partially destroyed by the base of the ulcer which had excavated into the organ for a distance of approximately two centimetres. The right lung exhibited pleural thickening and adhesions. The heart and mediastinal tissues were normal. Save for several small uterine myomata, no abdominal abnormalities were discovered.

The intracranial contents were normal. Unfortunately the spinal cord was not removed and no details of the state of the cord at the site of penetration of the canal can be given. Evidently the perforation had not caused a general septic meningitis, for the basal cerebral meninges were normal. Nor were any terminal symptoms of meningitis recorded in the clinical history. It is probable, therefore, that the site of penetration of the spinal canal was loculated off by local adhesions in a manner similar to that frequently seen in rodent invasion of the skull cavity.

The right elbow joint was the seat of complete, dense bony ankylosis at an angle of 95°. There was no evidence of any recent or residual inflammatory tissue likely to assist in identifying the nature of lesion.

Histological Findings.

Sections from several different parts of the ulcer margins and from the infiltrated lung were made. These all exhibited characteristic rodent structure with no trace of

cornification (see accompanying figure). In several situations penetration of small bronchi in the lung tissue was noted. In all sections the zone of growth was very narrow, consisting of a stratum of rodent tissue one to three millimetres in width, restricted to the base of the ulcerated area.

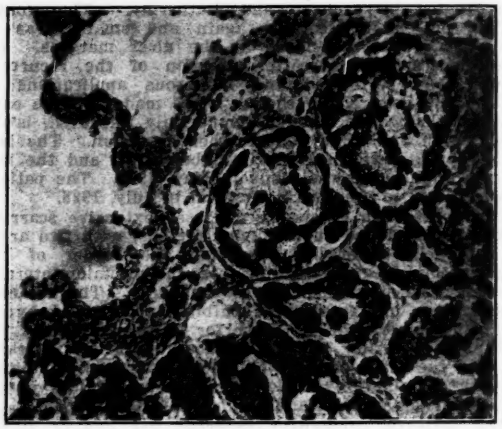

FIGURE I.

Photomicrograph from the base of the ulcer in the lung, showing typical rodent structure extending into the normal pulmonary tissue. The clumps and columns of tumour cells exhibit intervening accumulations of mucoid material, a frequent feature of rodent carcinoma. × 80.

Comment.

The condition described indicates that a rodent ulcer, wherever situated, may manifest the same progressive local tissue destruction which characterizes the facial growths of this kind. It is also of some pathological interest to note that rodent carcinoma is able to extend in pulmonary tissue. This suggests that the non-occurrence of pulmonary and other visceral metastases from this form of tumour is to be ascribed to its inability to penetrate veins and produce tumour emboli rather than to any intrinsic inability to proliferate in lung tissue.

Acknowledgement.

For permission to record the foregoing history I am indebted to Mr. C. J. O. Brown, of the Austin Hospital staff.

PREGNANCY WITHIN THREE MONTHS OF INTRAUTERINE APPLICATION OF RADIUM.

By BERNARD DAWSON, M.D., F.R.C.S.,
Honorary Assistant Gynæcologist, Adelaide Hospital.

As it seems to me very important that all items of information, no matter how small, should be placed at the disposal of everyone who is using radium, the following case is reported merely as an addition to the slowly accumulating mass of data concerning the intrauterine use of radium.

A woman of twenty-three years of age, of distinctly neurasthenic type, came to see me five weeks after her marriage. During the previous twelve months she had had two operations for some ill defined conditions which she summed up under that vague term "cysts on the ovaries." She complained of pain in both ilio-pelvic regions and down the left leg, anorexia, vomiting and loss of appetite. There was a slight white vaginal discharge and some frequency of micturition.

She menstruated every twenty-one days for a period of seven days; the loss was normal in amount and quality, but accompanied by pain for a week before, during and for a week after the period.

Her general appearance was one of good health and nutrition. The systolic blood pressure was 150 millimetres of mercury and the diastolic pressure 80 millimetres. Nothing abnormal was discovered in the chest. The temperature was 37·6° C. (99·8° F.) and the pulse 90. The abdomen was flat, moved well on respiration, but considerable tenderness was elicited in the left iliac region. Vaginal examination revealed a normal introitus and a vagina without stigmata of infection. The *os* was slightly patulous, but the fundus normal in shape, size and position. Painless scar tissue could be felt in the right broad ligament, whilst the left fornix was free from palpable abnormality, but very tender.

Under observation her symptoms remained unchanged and she exhibited an afternoon rise of temperature of from 37·2° to 37·8° C. (99° to 100° F.).

Various forms of conservative and palliative treatment producing no result, her abdomen was again explored. It was discovered that she had had her right tube and ovary and also her appendix removed. A round ligament shortening operation of the Gilliam type had been performed with a satisfactory result. Her left tube and ovary were healthy; there were a few unimportant omental adhesions and her caecum had a long mesentery, was large and distended and pelvic in position.

She menstruated whilst convalescent from this last operation in November, 1927, and again in December, 1927. She was seen again in March, 1928, after three months' amenorrhœa accompanied by irritability of the bladder and some nausea. She was not pregnant.

During April, May and June of 1928 she suffered from menorrhagia, losing excessively for two or three days with intervals of cessation lasting also two or three days. On July 3, 1928, she was examined under an anæsthetic, but nothing abnormal could be discovered. Twenty milligrammes of radium bromide were placed in her uterus for twenty-eight hours, the screen being one millimetre of platinum and an envelope of rubber drainage tube. This was followed by amenorrhœa throughout July and August, but in September she had a period normal in duration and loss.

Throughout October and November she experienced amenorrhœa and by December it was quite clear that she was pregnant. In July, 1929, she was delivered, without unusual difficulty, of a perfectly healthy child.

Four points of interest emerge:

1. The dose of radium, namely, 560 milligramme hours.
2. The immediate alleviation of the menorrhagia.
3. The early supervention of pregnancy.
4. The birth of a child free from defect.

RELIEF OF CARDIAC ŒDEMA BY PINEAPPLE JUICE.

By B. G. MAEGRAITH.
(Department of Human Physiology and Pharmacology, University of Adelaide.)

PINEAPPLE JUICE in small doses has long been a method of treating sore throats and has proved efficacious in reducing the œdema of quinsy. It was thought that general œdema might similarly respond to treatment with pineapple juice and this treatment was accordingly instituted in the following case of cardiac œdema, after all other recognized methods of treatment had been unsuccessful.

Clinical History.

The patient, Mrs. N., aged forty-eight years, was admitted to the Broken Hill District Hospital on November 15, 1929, complaining of swelling of the feet and shortness of breath.

She had suffered from these symptoms on and off all her life, but at the time of admission they were becoming worse.

She was so cyanosed in appearance as to suggest a patient with *polycythæmia rubra vera*. She stated that she had always been very highly coloured. She presented other symptoms suggestive of heart failure and was at once put to bed and given Guy's pill (*pilula digitalis composita*), one pill twice daily being continued throughout her treatment.

On examination the colour of her skin was found to be an intense livid reddish-blue and after pressure the colour returned slowly. The pulse was irregular, thin and fast. The legs were swollen and œdematous up to the hips and there was a lumbar pad of œdema extending to the last ribs. The œdematous region pitted deeply on pressure.

The apex beat was not palpable. The sounds were best heard in the fifth left interspace ten centimetres (four inches) from the mid-sternal line and there was a loud blowing systolic murmur heard at the apex and transmitted out into the axilla and upwards towards the pulmonary area where the murmur became almost as intense as at the apex. No thrill was detected. The diagnosis of the heart condition was "cardiac insufficiency resulting from congenital heart disease, probably a patent *ductus arteriosus*."

The liver was not palpable, but moving dulness in the flanks suggested some ascites. The whole of the abdominal wall was œdematous.

The examination of the blood revealed a white blood count of 12,000 and a red blood count of 5,000,000 per cubic millimetre (which excluded polycythæmia) with a hæmoglobin value of 100%. Coagulation time was three and a half minutes.

After two days in bed the condition of the patient was improved, her colour remaining unchanged. The pulse was slower and stronger, but still irregular.

A McLean's urea concentration test yielded the following results: 2·2%, 2·4% and 2·6% at hourly intervals. Blood urea nitrogen was estimated at 41 milligrammes per 100 cubic centimetres.

A week later the œdema had become worse and the patient appeared more deeply cyanosed. Her urinary secretion was low and she was given one cubic centimetre of "Novasurol" with little effect. A fortnight later the œdema was still extensive and there was evidence of collections of fluid in both pleural sacs. *Paracentesis thoracis* was performed and 900 cubic centimetres (thirty ounces) of clear yellow fluid were withdrawn from the right pleural sac. The fluid contained a few mononuclear leucocytes and nothing was cultured from it. It clotted rapidly. After the paracentesis the patient developed a slight subcutaneous emphysema which was absorbed in a few days. She improved for a few days, but the œdema did not lessen and the signs of fluid in the right pleural sac returned.

Up to this time her daily urinary excretion had been between 600 and 900 cubic centimetres (20 and 30 ounces), the urine being clear, of normal specific gravity and containing traces of albumin.

On December 17, 1929, she commenced to have the juice from one tin of pineapple every day. By January 1, 1930, the urinary output had risen to between 1,500 and 1,800 cubic centimetres (50 and 60 ounces) per day. On January 6, 1930, all œdema had subsided and the signs of fluid in the pleural sacs had gone. The patient felt better than she had been for years and was sitting up out of bed. She was passing 1,500 cubic centimetres (50 ounces) of urine a day.

On January 12, 1930, she was having an increased fluid intake. There was very slight œdema of both ankles. The urinary output had fallen off markedly in the last forty-eight hours and the patient desired discontinuance of the pineapple juice owing to intense thirst. The juice was discontinued and all other treatment stopped. On January 19, all œdema had gone, her urinary output was 900 cubic centimetres (30 ounces) in the twenty-four hours and she was walking about. Two days later she was discharged.

A fortnight later she reported to the out-patient department. The out-patient department's notes state that she was then well, but suffering from "very slight œdema." She was not then continuing the pineapple juice.

Conclusions.

1. The patient who, despite recognized medical treatment, became more and more water-logged and whose urinary output was diminished, responded at once to the ingestion of the juice of tinned pineapple.

2. Ordinary diuretics and even "Novasurol," proved of no avail, whereas a definite diuresis resulted from the pineapple juice. The question therefore arises as to whether the pineapple juice contains non-threshold (renal) substances and so acts similarly to ammonium chloride or whether there is some unknown diuretic entity contained in the juice.

3. The above case indicates that further work on the diuretic properties of pineapple juice might prove profitable.

Acknowledgements.

My thanks are due to Dr. J. C. Ross, of Broken Hill District Hospital, for permission to publish the case; to the Department of Physiology, University of Adelaide, and to Dr. R. F. Matters for assistance in presenting it.

Reviews.

INSTRUMENTAL TREATMENT OF HABITUAL CONSTIPATION.

IT appears like advocating the use of a hawser for mooring a rowing boat, to advise the use of a dilator in the treatment of constipation, unless the critic realizes that it is habitual constipation that is indicated and unless he considers in a scientific spirit the genesis of the complaint. True, he might not then consider his advisor correct in his deductions, but he would have probably formulated ideas concerning the treatment of constipation in opposition to the extensive use of purgation and in favour of regular habits, dietetic methods and mild aperients. Probably any specimen of the genus *Homo sapiens* considers that his knowledge of this subject is quite as extensive as that of any physician. This state of affairs is largely due to the lack of interest on the part of the physician in a function which he tends to consider unworthy of scientific investigation, partly because of its humble nature and partly because of influences which operate among civilized peoples very much like taboos do among the less civilized.

This failure of the medical profession to consider constipation as worthy of attention has led to the perpetuation of a state of affairs among the general public which is not in line with physiological principles, namely, the employment of free purgation.

Such a book as that under review, "Habitual Constipation and its Treatment," by H. M. Burnier, issued in the Minor Monograph Series, demonstrates the statement that purgation is unphysiological treatment for habitual constipation and goes on to advocate the use of an instrument which the author calls a "laxor" to dilate the *sphincter ani* and massage the rectal pouch when habitual constipation has led to a lack of sensitiveness to the ordinary stimulus to defæcation, namely, the presence of a sufficient mass of fæces in the sigmoid.

The general public would be surprised by the author's statement that purgatives do not cure constipation, for their conception of cure is not formulated rationally into that of restitution of the normal conditions nor are they aware of the physiology of defæcation. The effect of the purgative is to produce a new disability (diarrhœa) which

[1] "Minor Monograph Series: Habitual Constipation and its Treatment; An Account of a New Therapeutic Method," by M. H. Burnier, M.D., M.R.C.S., L.R.C.P.; 1929. London: Baillière, Tindall and Cox; Sydney: Angus and Robertson. Crown 8vo., pp. 71, with illustrations. Price: 4s. 6d. net.

leads to the emptying of the bowel and leaves no possibility of the rectum being stimulated normally on the following day or probably for several days. The individual, getting alarmed at the fact that he has had no motion for one or more days, then takes another dose of his favourite purgative and sets into action a vicious circle which may be very difficult to break when of long duration.

It is such patients as these, especially when they have produced an entero-colitis from the irritant effect of the repeated purgatives, that might conceivably be aided by the use of such an instrument as the author advocates.

The author, in his pardonable desire to have his "laxor" accepted as a satisfactory form of treatment for habitual constipation, has rather neglected to stress the prevention of habitual constipation which is obviously brought about by preventing occasional constipation. This being the case, he has been led to make an erroneous statement concerning the effect of diet. "Diet has often been looked upon as one of the causes of constipation. We think that is an error." It is true that he qualifies the statement later. Also he can perhaps be excused for over-emphasizing the factors that justify the use of the "laxor," namely, the tendency of civilized people to become constipated from neglecting to answer the "rectal call."

Constipation may be caused by vitamin deficiency. This is not mentioned; nor the psychological causes associated with improper habit formation in children.

This book is certainly worth reading by all medical practitioners, mainly because of its adverse criticism of the habitual use of purgatives, enemata and suppositories, but also because the "laxor" would be a useful instrument in advanced habitual constipation.

PROGRESS IN SURGERY.

WE have received the "Year Book" on general surgery. It is edited by Dr. Evarts A. Graham, Professor of Surgery in the Washington University.[1]

This work is a review of anything new or of note in the surgical world and is wonderfully embracing in its scope. Most points in surgery are touched upon, whether it be post-operative thrombosis or the efficiency of mercurochrome as an antiseptic.

Anæsthetists will find much material to interest them under the heading of general, local and spinal anæsthesia. In passing it may be mentioned that the book shows that spinal and local measures are not unattended by disaster.

The question has again arisen and is discussed as to whether duodenal ulcer ever results from the presence of burns.

It is suggested that shock be treated by the dextrose-"Insulin" method. One thousand cubic centimetres of 5% to 10% dextrose solution are injected intravenously over a period of one hour. "Insulin" is used in the proportion of one unit to three grammes of dextrose in two doses, one fifteen minutes after beginning and the second at the end of the transfusion. It is said that the benefit is indisputable.

The book contains a discussion as to whether antitoxin is of any value in well established tetanus. Consensus of opinion quoted from different clinics would seem to point to the decision that it is not.

There is fairly extensive prominence given to the subject of cancer: the question of its increase, its operability, its ætiology.

A full description is given of different methods of injecting veins, special reference being made to the method of G. H. Colt, of Aberdeen, but to us the method seems cumbersome and not unattended by risk.

According to J. de J. Pemberton, of the Mayo Clinic, the stage operation for exophthalmic goitre had been reduced to less than 2% and the mortality to 0·72%. This result has been partly achieved by the use of iodine therapy beforehand. In addition there is a very full account of procedure in different aspects of exophthalmic goitre in all parts of the world.

Interest circles round the question of operation or irradiation in breast tumours and a full record of achievement will be found in the book.

Those who are particularly interested in gastric and duodenal surgery, will find interest in the material collected from different clinics. The question of resection or simply gastro-enterostomy is fully discussed.

The view is fairly well supported that chronic diverticulitis without complications should not be operated upon, but controlled medically.

The book is a tribute to the searching quality of its author's reading and is well worth having as a work of reference.

[1] "The Practical Medicine Series, Comprising Eight Volumes on the Year's Progress in Medicine and Surgery": General Surgery, edited by Evarts A. Graham, A.B., M.D.; 1929. Chicago: The Year Book Publishers. Crown 8vo., pp. 800, with illustrations. Price: $3.00 net.

Notes on Books, Current Journals and New Appliances.

THE MELBOURNE HOSPITAL CLINICAL REPORTS.

THE first number of *The Melbourne Hospital Clinical Reports* has been received. The reports, edited by Dr. S. O. Cowen, will be issued twice a year. It is intended that in this journal will be published clinical and experimental work which for various reasons is not submitted to existing journals. In this number there appear several reports of interest. H. F. Maudsley and R. J. Wright-Smith report a case of Schilder's disease and K. D. Fairley writes on the diagnosis and prognosis of complete block of the right branch bundle of His. R. R. Wettenhall writes on the treatment of furunculus with special reference to the part played by X rays. There are reports of cases by Dr. T. A. F. Heale, Dr. L. E. Hurley, Dr. K. Hiller, Dr. W. W. S. Johnston, Dr. R. A. Willis, Dr. J. A. Larwill, Dr. F. B. Lawton, Dr. G. A. Pennington, Dr. A. E. Coates, Dr. J. M. Lewis, Dr. M. A. Stewart. We are in entire agreement that work of an interesting nature done at teaching hospitals should be reported. Our trouble has been to prevail on those with clinical material at their disposal to do their duty. Reports likely to add to knowledge should be circulated as widely as possible.

GUY'S HOSPITAL REPORTS.

THE April, 1930, issue of *Guy's Hospital Reports* has come to hand. It contains articles of interest. Dr. John A. Ryle writes on the natural history, prognosis and treatment of staphylococcal fever, Dr. H. W. Barber on staphylococcal infections of the skin, Dr. J. L. Joyce on staphylococcal disease as it affects the kidneys and Dr. Hugh Barber reports a staphylococcal perinephric abscess. Dr. J. F. Venables describes two cases of severe anæmia due to infection of the gall bladder with a hæmolytic staphylococcus and Dr. L. J. Witts discusses staphylococcal septicæmia complicating Addison's anæmia. These articles are of unusual interest and importance in view of the increased attention recently paid to staphylococci. Dr. J. F. Venables describes nine cases of *anorexia nervosa* and studies the pathogenesis of the condition. Dr. L. Bromley describes a gastro-jejunal ulcer which followed immediately after gastro-jejunostomy. Dr. George Syllaba contributes a paper on the influence of saccharine on the respiratory exchange and on the blood sugar level. Among the other articles is one by Dr. A. F. Hurst on prophylaxis in persons predisposed to pernicious anæmia; this is discussed in another place in this issue. Dr. P. F. Armand-Delille, Dr. Hurst and Dr. V. E. Sorapure describe a remarkable instance of familial eosinophilia. In one person the eosinophile cells varied between 51% and 62% and the total leucocyte count between 13,800 and 29,600 per cubic millimetre.

The Medical Journal of Australia

SATURDAY, JULY 19, 1930.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: Initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction, are invited to seek the advice of the Editor.

FOLLOW-UP SYSTEMS.

THE duty of hospital administrators does not begin with the admission of patients for treatment and end with their discharge. Neither does the responsibility of the honorary medical officer cease when, after treating patients according to his own preconceived ideas or by the means that he is most accustomed to use, he allows them to go home. Perusal of most, if not all, of the hospital reports issued annually would give the impression that these narrow limitations are commonly accepted. The number of admissions is stated and compared with those of previous years, the operations performed are given picturesque prominence, diseases and operations are tabulated and the sufferers of each are divided into perhaps three groups, often designated: "cured," "relieved" and "died." In these circumstances "cure" presumably means that the patient was free from symptoms at the time of discharge from hospital. No description of important routine methods is given, no attempt is made to compare the results of different types of treatment of the one condition and no information is given of the condition of patients at different periods of time after they leave the institution. The reason for the formal and scrappy nature of hospital reports lies undoubtedly in the fact that they are issued as propaganda, as a sprat to catch the mackerel in the form of monetary contributions. The responsibility of hospital authority and medical attendant beyond that of immediate treatment extends in several directions. In the present discussion attention will be confined to the need for keeping in touch with the patient by what is known as the "follow-up" system.

In the ideal "follow-up" system all patients are submitted to a routine examination every few months after their discharge. This has two main objects. The first is that any recurrence of illness or relapse is immediately discovered and the second is that information is gained as to the value of methods of treatment for comparative purposes. The first is the more important. There are many conditions of a minor nature in which it would not be necessary to submit patients to regular examinations; the authorities and medical staffs of each institution or group of institutions could determine those that might be omitted. Such conditions as gastric and duodenal ulcer and tuberculosis in any part of the body may be quoted as examples of those in which a follow-up investigation is essential. There are many more. Signs are not wanting that medical practitioners are realizing the wisdom of keeping in touch with, at any rate, those patients afflicted with certain types of ailment. But sporadic effort is not what is wanted. This matter should be taken up first of all by the larger teaching hospitals and it will not be done unless the medical staffs are insistent. In other words, the controlling bodies of hospitals must be taught the importance of preventive measures.

The installation of a satisfactory "follow-up" system in a hospital will necessitate the keeping of complete records and their arrangement in suitable index form. It would also be found essential to employ a full time officer to superintend the tracing of the patients and the tabulation of results. A complete scheme for such a department was drafted at the congress held in Sydney last September by Dr. R. A. H. Fulton, of Dunedin. It would be found advantageous under any scheme to employ nurses in the manner described at the same congress by Dr. Bell Ferguson in connexion with his tuberculosis work in Melbourne. One outcome of this undertaking would be the much talked of education

of the public—"that blessed word Mesopotamia." Another would be the training of students in the habit of following patients beyond the stage of convalescence. If patients learn to expect examination after illness and students are brought up to regard follow-up examination as part of the routine of their professional life, there need be no fear in the future in this respect and progress will be made in preventive medicine.

Current Comment.

GOITRE.

WITHIN recent years a great deal of attention has been paid to a study of the diet of people in endemic goître areas and the view that goître is due to insufficiency of iodine has become more or less general. Many believe, however, that iodine deficiency alone does not cause goître, but that some additional factor such as sepsis is necessary. At the Australasian Medical Congress (British Medical Association) held in Dunedin in the year 1927, Hercus read a paper in which he expressed the opinion that the hypothesis that goître is caused by a deficiency of iodine had been fully sustained. In the discussion which followed, he agreed that certain secondary factors may sometimes operate, but asserted that the primary factor is iodine deficiency. A great deal of evidence in favour of this view has been brought forward. Salmon and trout, kept under crowded conditions and in water which is not changed frequently, are apt to suffer from hypertrophy of the thyreoid, but it has been shown by Marine and Lenhart that the addition of potassium iodide to the water causes a return of the gland to normal. In the Yellowstone River Valley one million young pigs and numerous lambs, calves and foals died annually as a result of disease of the thyreoid; Smith proved that normal offspring could be expected if the pregnant animals were given potassium iodide or sodium iodide. The administration of iodides to school children in endemic areas has been proved to be of great value in prophylaxis. Marine and Kimball administered sodium iodide to 764 school girls and observed 1,879 others as controls in Akron, Ohio, over a period of six months. Their results appear to indicate that iodine prevents goître and is capable of causing a return of the enlarged thyreoid to normal, while its insufficiency is apt to lead to hypertrophy of the gland. In this regard, however, it should be noted, as mentioned by Harvey Sutton at the Dunedin Congress, that thyreoid enlargement in girls may be physiological whereas in boys it is always abnormal.

R. McCarrison has always been rather at variance with most other observers in regard to the place occupied by iodine deficiency in the ætiology of goître. It is interesting, therefore, to read a recent paper of his on the subject and to compare his conclusions with the more generally accepted views on the matter.[1] McCarrison repeated on a large scale the experiments of Haydon, Wenner and Rucker who showed that the thyreoids of rats fed on a diet containing nine micromilligrammes of iodine per kilogram over a period of six weeks hypertrophied, while rats fed on the same diet but to whose water supply iodine in the proportion of 0·1 milligramme per litre had been added, did not develop goître. The experimental diet consisted of oatmeal 53 parts, cornflour 25 parts, linseed meal 20 parts, sodium chloride one part, calcium phosphate one part and distilled water *ad libitum*. Three analyses of the dry food by the method of von Fellenberg showed the iodine content to be 20 γ, 125 γ and 150 γ per kilogram respectively. McCarrison points out that the same type of food obtained from different sources has been shown to vary greatly in iodine content and, furthermore, he expresses doubt as to the accuracy of von Fellenberg's method when the amount of iodine present is less than 100 γ per kilogram. He accordingly no longer analyses the food, but uses as an index of iodine metabolism the quantity of iodine excreted in the urine. Analysis of the urine is easier and not so fallacious and 20 γ per litre may be estimated with comparative accuracy. McCarrison found that normal, well-fed rats in his laboratory excreted from 56 to 85 γ of iodine per litre of urine; rats fed on the experimental diet without additional iodine excreted 33 γ per litre and those to whose water supply 0·1 milligramme of iodine had been added, excreted 85 γ per litre. In a second experiment, when 1·0 milligramme of iodine was added to each litre of water supply, the rats excreted iodine in the proportion of 559 γ per litre of urine.

It has been stated that rats are prone to goître under natural conditions and that they are thus not suitable animals for use in this type of experiment, but McCarrison declares that goître does not normally occur among rats in his laboratory.

In the first experiment 120 young rats of mixed sexes were used. Sixty were fed on the experimental diet without additional iodine and sixty were fed on the same diet, but were allowed 0·1 milligramme of iodine to each litre of water supply. Thirty in each division were kept under scrupulously clean conditions and thirty in cages with wooden floors which were not kept clean. The cages were of uniform size and were sufficiently large to prevent crowding. Eight animals—two from each of the four groups—were killed on the thirty-fifth day, eight on the forty-ninth day and eight on the sixty-fourth day of the experiment. Expressed in milligrammes per 100 grammes of body weight, the average weight of the thyreoids of animals supplied with additional iodine and kept under clean conditions was 7·2 and under dirty conditions 7·8; of those denied additional iodine, but kept under clean conditions, the average weight of the thyreoids was

[1] *Indian Journal of Medical Research*, April, 1930.

8·3 milligrammes per 100 grammes of body weight and of those kept under dirty conditions 9·3 milligrammes.

In the second experiment slightly older rats were used. Eight animals from each of the four groups were killed on the sixtieth day of the experiment. The average weight of the thyreoid in milligrammes per 100 grammes of body weight of animals which had received additional iodine and which had been kept under clean conditions, was 10·6 and of those kept under dirty conditions 10·7; of those which had received no additional iodine and had been kept under clean conditions, the average weight of the thyreoid was 9·4 milligrammes per 100 grammes of body weight and of those kept under dirty conditions 10·9 milligrammes. A noticeable feature of this second experiment was the high mortality rate among animals which had received no iodine; only 50% of these were alive on the sixtieth day. The relatively great increase in the weight of the thyreoids of animals living under clean conditions and taking iodine is accounted for by the fact that ten times as much iodine was given in this experiment as in the first experiment and a stimulation of the thyreoid resulted.

Histological examination of the thyreoids of rats which had lived under hygienic conditions revealed no appreciable structural changes; appearances were the same whether iodine had been administered or not; active secretion was rather more evident than in glands of well fed animals of the same age; there was no hypertrophy. The histological appearances of the glands of rats which had lived under unhygienic conditions, were mainly those of the normal organ, though there was evidence of a slight degree of hypertrophy which should be regarded as compensatory in character. The administration of iodine prevented this hypertrophy, but did not cause the gland to fall into a resting state; indeed, active secretion was a feature.

McCarrison is of the opinion that the results of these experiments suggest that the insanitary conditions were the cause of the enlargement of the thyreoid, but that the administration of iodine counteracted the ill-effects of dirt. He points out, however, that the diet used in the experiments had many faults, the most important of which was vitamin *A* deficiency which led to metaplastic changes in the thyreoid as well as in other organs and rendered the animals more susceptible to infection. He believes that three factors were concerned, namely, low level of iodine metabolism, susceptibility to infection of the intestinal tract and contamination of food by excreta of animals living under unhygienic conditions. He believes that the dominant factor is the third and that neither of the others is capable of causing goître in its absence.

McCarrison does not set down as a comparison or standard the average weight of thyreoids of healthy, well fed rats in his laboratory nor does he remark on the effects of unhygienic conditions on well fed animals. In the absence of this information the reader might well draw entirely different, though equally rational, conclusions. The glands in the second experiment were considerably larger in proportion to body weight than in the first experiment and a reasonable assumption would be that some hypertrophy did occur. In fact it might well appear that iodine deficiency caused goître and that when unhygienic conditions prevailed a secondary factor, that is, infection, appeared; infection was all the more readily introduced on account of the animals' low resistance due to vitamin *A* deficiency.

An observation on animals fed on a diet deficient in iodine but adequate in all other respects would be of value, especially if a comparison were made between animals kept respectively under clean and dirty conditions. McCarrison's interpretation of the results of his experiments appears to be rather in the nature of a special plea, and, while it is extremely interesting, it is scarcely convincing on the evidence he produces.

PROPHYLAXIS OF PERNICIOUS ANÆMIA.

THE ætiology of pernicious anæmia has often been discussed in these pages. The relationship of achlorhydria to the disease has been emphasized as well as the need for the ingestion of liver throughout the patient's life time. Persons with achlorhydria have been referred to as candidates for pernicious anæmia. This view is that held by A. F. Hurst, of Guy's Hospital. He has recently reported two cases which serve to illustrate the need for prophylactic treatment.[1] The first patient was a woman, aged sixty-one years, who was found to be suffering from cholecystitis. Her two brothers had died of pernicious anæmia. When she was examined, she was found to be suffering from achlorhydria. Her blood picture was normal. She was told that she ought to take a drachm of dilute hydrochloric acid every day before each of her three meals and that she would have to continue this throughout her life. She carried out the treatment for "a very short time" and about twelve months later was found to be suffering from typical pernicious anæmia. The other patient was a woman, aged fifty years. She came complaining of soreness of the tongue and worried because several of her relatives on both sides of her family had died of pernicious anæmia. She was found to have *achylia gastrica* and atrophic glossitis. She was only slightly anæmic, but had definite megalocytosis. She was given dilute hydrochloric acid three times a day, together with a mixture of iron and ammonium citrate and *liquor arsenicalis*. Considerable improvement resulted and she was advised to continue taking the acid and to eat half a pound of liver every day. Five years later she was in good health. Achlorhydria must always be regarded as a serious condition, especially if there is a family history of pernicious anæmia. By continuous treatment alone can disaster be averted in these circumstances.

[1] *Guy's Hospital Reports*, April, 1930.

Abstracts from Current Medical Literature.

THERAPEUTICS.

Quinine Dihydrochloride.

A. B. GRAHAM (*Journal of the American Medical Association*, October 19, 1929) describes the action of quinine dihydrochloride on the intestine. Suppositories containing 0·3 gramme (five grains) with oil of theobroma of low melting point were used; they were placed in the recta of 185 patients, many of whom were chronically constipated. A bulky stool was passed by 76% of these patients within a quarter of an hour to ten hours. On some the effect of the drug in expelling a barium enema was noted. There were no obvious alterations in the haustration of the colon, even though the patient had an acute desire to defæcate. The effect was apparently due to stimulation of the anal canal by an irritant. Somewhat similar results were obtained when oil of theobroma was used alone; but a satisfactory stool was passed by fewer patients. In some the quinine caused anal irritation and tenesmus, especially when anorectal disease was present. The main effect of the quinine was on the colon and rectum.

Potassium Sulphocyanate.

R. S. PALMER and others (*New England Journal of Medicine*, October 10, 1929) discuss the clinical use of potassium suplhocyanate in hypertension. Fifty-nine patients were treated; 0·09 gramme (one and a half grains) of the drug in a drachm of water was administered thrice daily the first week, twice daily the second week and once a day the third week. In twenty-five patients the systolic blood pressure fell thirty millimetres of mercury or more. In many of these the blood pressure rose again by five to forty-five millimetres of mercury. In seven out of fourteen patients in whom a fall of blood pressure occurred, an improvement in health was noted; in others no apparent benefit was felt. Weakness, præcordial pain, exhaustion or diarrhœa was noted in a few instances. In some patients with chronic renal changes or evidence of coronary sclerosis ill effects were more marked and the drug should be used with care in these cases. Several patients were observed for eighteen months, but no permanent good results were noted. The investigations are being continued.

"Higuerolatex" in the Treatment of Trichuriasis.

FRED C. CALDWELL AND ELFREDA L. CALDWELL (*American Journal of Tropical Medicine*, November, 1929) discuss the treatment of trichuriasis by the administration of the sap of *Ficus laurifolia* and comment on its action against ascaris infestation. The anthelmintics commonly employed are as a rule ineffective against trichuris. *Lèche de higueron*, the fresh latex of *Ficus laurifolia*, has been used by the natives of South America in the treatment of worm infestations. A preparation of the sap of *Ficus laurifolia*—"Higuerolatex"—kept cool in dark bottles for almost a year before use, was found by the authors to be highly effective in the treatment of trichuriasis and ascariasis. The drug was administered in milk as a single dose of thirty cubic centimetres in one group and sixty cubic centimetres in a second and larger group. No food was allowed on the morning of treatment and only a light supper the evening before. No preliminary purge was administered. In the first group of nine patients the treatment was followed by a reduction of 89·5% in the number of ova per gramme of formed stool, while 22·2% of patients were apparently cured. In the second group of 117 patients there was a reduction of 85·4% in the egg output, while 53·8% of patients were apparently cured. The use of oil of chenopodium in a control series resulted in a 17% diminution of the egg output and a cure in 1·7% of patients. Thirty-seven persons, infested with ascaris, were treated with "Higuerolatex," the egg output being thereby reduced by 89·7%, while 70·3% of patients were apparently cured. At the same time, of twenty-seven ascariasis subjects treated with oil of chenopodium, 83·8% were cured, while a reduction in egg output of 83·2% was observed. The specificity of oil of chenopodium for ascaris is emphasized by results obtained from the treatment of twenty-seven patients in 1927, when there was a reduction of 94·9% in egg output and 92·2% of patients were apparently cured.

Esters of Calophyllum Bigator in Treatment of Leprosy.

M. E. A. NEFF (*Journal of Tropical Medicine and Hygiene*, September 2, 1929) gives a preliminary report on the use of esters of *Calophyllum bigator* in the treatment of leprosy at the Central Leper Hospital, Makogai, Fiji. *Calophyllum bigator* is a large member of the calophyllum family, found growing on or near the beaches of the Pacific islands and many other tropical countries. The oil of the nuts of this tree has been used for ages by the Fijians as an embrocation and in this respect it has merit. Broken kernels are placed on sloping corrugated iron sheets in the sunshine; after two or three days oil starts to trickle out. When the sun's action ceases to be effective, the remaining oil is squeezed out by means of a hand press. The oil is thick, bluish-black, with a characteristic cloying pungent odour. Injection of the crude oil into guinea-pigs caused fatal tissue necrosis. Esterification was carried out by the method described by Rogers and Muir and the esters were injected into guinea-pigs in doses increasing from 0·5 to 5·0 cubic centimetres, with negligible local reaction and no apparent harmful effects. Intramuscular injections into patients suffering from leprosy were followed by improvement in 70%, but results were not so good as those obtained when esters of hydnocarpus and sodium salts of the chaulmoogric series were used. However, the nerve pains of leprosy were relieved rapidly and completely after one to three intramuscular injections of five cubic centimetres of the drug. On account of its seeming predilection for nerve tissue, its use combined with ethyl esters of *Hydnocarpus wightiana* is suggested. Pain at site of injection is not severe, nor is the local reaction. The esterified oil is far superior to the crude oil as an embrocation and to any other embrocation encountered by the author. Its possible value in acute and subacute rheumatism and arthritic conditions generally is suggested.

Congo Red and Hæmostasis.

J. BECKER (*Münchener Medizinische Wochenschrift*, March 7, 1930) states that following animal experiments on the effects of various neutral dyes on the coagulation time of the blood he has employed Congo red in cases of pulmonary hæmorrhage due to tuberculosis. Immediate stoppage of the hæmorrhage followed the intravenous injection of ten cubic centimetres of a 1% solution of chemically inactive Congo red in five cases. No harmful after results were noted. Within two to six hours a definite reduction in the coagulation time was observed and this continued for twenty-four hours before a return to normal. The blood platelet count showed considerable increase within a week to three times the previous amount and then slowly returned to normal. He believes that the dye acts by stimulating the endothelium of the blood and lymph capillaries in the reticuloendothelial system and in particular stimulates the formation of thrombokinase.

Neurosyphilis.

H. C. SOLOMON (*Annals of Internal Medicine*, November, 1929) discusses the treatment of neurosyphilis. He maintains that complete serological recovery and a cessation of progress of clinical symptoms can be obtained in a large proportion of all cases of neurosyphilis. "Tryparsamide" and malaria treatment are the most satisfactory and these methods are superior to intraventricular, cisternal or intraspinal serum injections and to arsphenamin, bismuth, mercury and iodide. Long continued treatment with "Tryparsamide" is necessary, as many as 183 injections having been given to one patient in five years. If "Tryparsamide" does not yield good results, malaria infection should be tried and treatment should be continued with the object of obtaining normal serological findings. With "Tryparsamide" cumulative effects are rare. In meningo-vascular syphilis and tabes malaria treatment is not

usually necessary; combinations of "Tryparsamide," arsphenamin, mercury and bismuth and intrathecal methods nearly always succeed.

"Percain."

H. RICHTER (*Deutsche Medizinische Wochenschrift*, February 14, 1930) details the result of his investigations with the synthetic local anæsthetic "Percain." It is soluble in water and remains well suspended in solution. No local effects on the tissues have been noted. He advises a 2% solution for most naso-pharyngeal work and considers that it is equivalent to 10% cocaine with none of the disadvantages of the latter. It can be combined with adrenalin. The rapidity of action and duration of effect are the same as with cocaine. Of importance is its much lower cost. In his opinion it cannot replace "Novocain" for infiltration anæsthesia because of the shorter duration of its effect.

NEUROLOGY.

Alcohol Injections in Trigeminal Neuralgia.

MARIO DOGLIOTTI (*Medical Journal and Record*, February 5, 1930) states that his method of choice for the treatment of trigeminal neuralgia is the injection of alcohol into the Gasserian ganglion. He comes to this conclusion after experience of major surgical measures, including resection of the sensory root of the fifth nerve, after Frazier, Cushing and others. He points to a series of thirty-eight patients in whom even after three years, there has been no return of the neuralgia. The technique used is after that of Härtel, but these supplementary points may be noted: 1. Use a stiletted needle and when the point is thought to be in the Gasserian ganglion, withdraw the stilette and look for the escape of blood or cerebrospinal fluid; either of these would indicate misdirection. 2. If X ray apparatus be available, use this for determining the exact position of the needle. 3. Look for disappearance of the corneal reflex as a certain sign that the alcohol has penetrated the ganglion.

Cleido-Cranial Dysostosis.

R. M. STEWART (*Journal of Neurology and Psychopathology*, January, 1930) had the rare good fortune to obtain a *post mortem* examination in a case of cleido-cranial dysostosis. This disease, as its name implies, has for distinguishing clinical features defective ossification of the cranial bones and absence of a part or the whole of the clavicles, with corresponding deficiency of the trapezius muscles. The *post mortem* findings were a most striking and extensive sclerosis and microgyria affecting both frontal lobes anterior to the central gyri. The conclusion was that in some way the brain lesion and the non-development of the clavicles are related. It is suggested that the brain lesion synchronized with the time that the clavicles began to ossify, both having been determined by the same agency. It is confusing that the brain lesions recorded by others differ both in site and kind. Marie and Sainton found "a large syringomyelia," Schaulthauer found cavities the size of a pigeon's egg in each frontal lobe and Léri and Trétiakoff a large cyst in the occipital region.

Cerebral and Spinal Complications During Pregnancy and the Puerperium.

B. J. ALPERS AND H. D. PALMER (*Journal of Nervous and Mental Disorders*, November, 1929) write a critical review on cerebral and spinal complications during pregnancy and the puerperium. Hemiplegia is rare and when it occurs, is due to cerebral hæmorrhage rather than to thrombosis or embolism; uræmia may be an association. Thrombosis of cerebral veins and sinuses is an affection of the puerperium only. Puerperal aphasia is peculiar only in as much as it occurs in the puerperium. Some vascular disease is its cause, as in any other kind of aphasia. Hysterical aphasia does not come in this category. Tumour of the brain is a rare complication of pregnancy. Lethargic encephalitis may complicate both pregnancy and the puerperium and be difficult of diagnosis. The mortality rate is high. Should the patient survive and again become pregnant, Parkinsonism may result. Labour need not be interfered with and the effects on the fœtus seem to be negligible. The well known *chorea gravidarum* arises within the first six months of pregnancy and terminates either by cessation of the choreic movements after a period of some weeks or in death. The cause remains a mystery and opinions are divided as to whether it is a disease *sui generis* or identical with Sydenham's chorea. Visual disturbances in pregnancy are common. Blindness, partial or complete, transitory or permanent, is frequent and often concurrent with uræmia and albuminuric retinitis. Termination of pregnancy may operate favourably. Optic atrophy *sui generis* is rare. Meningitis, myelitis, hæmatomyelia, tumours of the spinal cord and Friedreich's ataxia are other conditions which have been recorded as arising in pregnancy.

An Acute Azotæmic Encephalitic Psychosis.

E. TOULOUSE AND L. MARCHAND (*La Presse Médicale*, April, 1930) record observations on fifteen cases of a psychosis to which they give the above title. Nearly all the subjects were women, about the age of thirty years. First came a period of invasion lasting from a few days to some weeks. Then the psychosis fulminantly declared itself by a phase of the most intense and uncontrollable maniacal agitation and confusion which lasted from five to eight days. Next came a period of comparative calm, lasting from three to five days, which was falsely encouraging, because it ended in torpor, coma and death. No less than fourteen of these fifteen patients died. An early, decided and constant increase in the quantity of urea in the blood (azotæmia) and in the cerebro-spinal fluid was an important clinical finding. While as to the brain, histological examination showed diffuse inflammatory changes described as capillaritis and satellitosis, specially affecting the frontal lobes and bulb. Since all these cases arose during one winter and in all there was some degree of fever, an infection of some kind was suggested. Epidemic encephalitis was thought of, but rejected. Neither was there an epidemic of this disease current, nor were any of the usual diagnostic signs present.

Narcolepsy and Erythræmia.

J. LHERMITTE AND E. PEYRE (*Revue Neurologique*, February, 1930) remind us that while some regard narcolepsy as a distinct entity, there are others, including Lhermitte, who maintain that it may be conditioned by all manner of organic causes and is not a disease, but a symptom. A typical example is recorded in a youth of twenty-three years who fell asleep not only when sitting, but even walking and eating, and who was subject to characteristic cataplectic attacks under emotional disturbance, as when playing cards. The remarkable fact is that searching examination disclosed no concomitant affection or other sign of disease until the blood was examined and a count of 8,000,000 red cells proclaimed the existence of erythræmia (Vaquez's disease). It is suggested that this association is more than fortuitous, because hypersomnia is a recognized accompaniment of essential erythræmia. And, by the way, many erythræmics end their days in mental hospitals.

Acute Ataxia after Chicken Pox.

LUCIEN CORNIL AND PIERRE KISSEL (*Revue Neurologique*, February, 1930) state that nervous manifestations in connexion with chicken pox, although infrequent, have been much written about, for example, the association of *herpes zoster* with this disease. In this paper a much less common complication, namely, acute ataxia, is described. The case concerned a child of four years, who on the fifth day after a mild attack of chicken pox, exhibited a typical cerebellar syndrome, first unilateral, then bilateral, characterized by static tremor, ataxic gait with lateropulsion, dysmetria, adiadococinesia and scanning speech. Recovery took place in fifteen days and there were no sequelæ. Corresponding cases are cited from the literature on the subject. The explanation of post-varicellal encephalitis, for such it must be, is far from easy, but the mode of action of the virus and the clinical picture suggest some sort of relation with epidemic encephalitis, small pox, post-vaccinal encephalitis and *herpes zoster*.

Special Articles on Diagnosis.

Contributed by Request.

III.

DISEASES OF THE THYREOID GLAND.

THE range of diseases or disorders to which the thyreoid gland is subject, is limited in the main to certain well defined conditions, but the intermediate or compound phases often cause one to ponder over the extraordinary position this gland occupies in the physiological well-being of the individual.

For practical purposes it is as well to plan a classification on as simple a basis as possible and I think the following headings on the lines of those suggested by Crile will cover most cases: (i) Simple hyperplasia, (ii) diffuse colloid enlargement, (iii) adenomata and cysts, (iv) thyreotoxicosis, (v) myxœdema, (vi) malignant disease, (vii) inflammatory changes.

Although we can recognize distinct groupings according to this clasification, we must never lose sight of the fact that it is common for one of these conditions to merge into another or for one to be superimposed on another. Perhaps the most interesting and also confusing is that of a toxic condition along with undoubted signs and symptoms of hypothyreoidism. We may now proceed to a brief review of each of the broad classes outlined.

Simple Hyperplasia.

Simple hyperplasia consists of a general enlargement of the gland, varying in size from a scarcely palpable expansion to a definitely obvious increase in size which renders the whole gland easily palpable and it constitutes a distinct swelling in the neck.

The gland is moderately firm in consistence, smooth in contour, painless and symptomless. This condition is usually met with about the age of puberty, is not uncommon up to the early twenties, but beyond that age is rare. Definite increase in size is frequently observed at the menstrual period and during pregnancy. There should be no difficulty in its diagnosis.

Diffuse Colloid Goitre.

When diffuse colloid change affects the whole gland, this condition may give rise to the largest goitres met with. The average case is represented by a general enlargement of the gland approximately four to six times the normal. It is very firm on palpation and quite symptomless. In some cases one lobe may be much more enlarged than the other and if the protrusion is forwards, it may in time develop into a "pendulous" goitre. Occasionally the very large types cause compression of the trachea, but it is rare for symptoms to follow unless the main growth is retro-sternal. The occurrence of colloid goitre is generally common to certain districts.

Adenomata and Cysts.

Adenomata and cysts may exist separately or along with one another, be single or multiple and vary greatly in size. In most cases they are quite obvious and definitely palpable as distinct entities in the normal gland tissue. It is possible for them to attain a large size and cause pressure symptoms. Adenomata which are becoming cystic, are liable to rupture of a blood vessel and rapid increase in size of the swelling with or without pressure symptoms is noticed by the patient. Their greatest danger lies in the fact that they are prone to cause toxic symptoms, often of a mild character, extending over many years, so that a sudden breakdown of the cardiac musculature may be the first indication of serious trouble. Toxic symptoms are prone to develop during the thirties, are not accompanied by exophthalmos and are frequently mistaken for neurasthenic manifestations. The basal metabolism is generally somewhat raised and in all doubtful cases it should be determined.

Adenomata may undergo carcinomatous change without much external evidence and a metastasis in one of the long bones may be the first signs of the changed character of the goitre. Owing to the proclivity of adenomata or cysto-adenomata to assume serious characters in the third and fourth decades of life, their surgical removal is strongly indicated in their early stage of development, when the patient first seeks advice, irrespective of the size of the tumour. A word of warning against the use of iodine in these cases is advisable, as it may induce a a toxic condition which, once initiated, is incapable of control by other than surgical measures.

Thyreotoxicosis.

Many names have been given to thyreotoxicosis and many classifications have been drawn up, but on the whole it seems that it is a single entity revealing various phases according to (i) the age of the patient, (ii) the character of the stimuli concerned in the ætiology of the condition (chiefly infective or psychic trauma), (iii) the condition of the gland itself at the time of onset of toxic symptoms, (iv) the state of the body tissues in general but the myocardium in particular, and (v) the rate of liberation and absorption of the toxic substance from the gland. Dunhill has recently elaborated this point of view and considers that the variation in these factors and their interrelationships give a sufficient explanation of the types of toxic goitre—why in youth and early adult life we have the picture described as "exophthalmic goitre"; why this type becomes less frequent with the succeeding decades although it never disappears; and why the type described as "toxic adenoma" rarely occurs in early adult life, but becomes the increasingly predominant type in the later decades.

The essential characteristics of thyreotoxicosis are: (i) The rapid pulse with the accompanying palpitation, dyspnœa on exertion, flushings *et cetera*, (ii) the fine fibrillary tremor best seen with the upper limb held rigidly on a level with the shoulder and wrist dorsiflexed, (iii) a sense of weakness and inability to maintain any effort, mental or physical, (iv) an increase in the basal metabolic rate of the body tissues, (v) a certain periodicity of the toxæmia, so that the patient experiences waves of exacerbation in the symptoms alternately with periods of comparative well-being.

Exophthalmos is chiefly met with in the acute cases where onset is rapid and the body is flooded with the toxic production of the gland.

The list of symptoms and signs on record in this disease covers a wide field, but all are dependent on or associated with those mentioned. For practical purposes it will be found possible to place all toxic conditions of the thyreoid gland in one of two classes, namely, *A*, primary, or *B*, secondary thyreotoxicosis.

Primary Thyreotoxicosis.

Primary thyreotoxicosis is exemplified by the well known condition of Graves's disease or acute exophthalmic goitre. It is essentially a condition met with in early adult life. Below twenty years of age the prognosis becomes increasingly worse, the younger the individual. In the later decades prompt treatment is demanded before the heart muscle gives way. In its very earliest stages, that is, the first two or three months, much can be done to relieve the condition by careful medical treatment, including removal of septic foci and in a few cases actual cure seems to be achieved. If the condition has gone on for six months or more a generalized fibrosis occurs in the gland, although medical treatment may lead to amelioration of the symptoms, it seems that surgical measures are necessary for actual cure.

Secondary Thyreotoxicosis.

In secondary thyreotoxicosis the symptoms vary according to the condition of the thyreoid gland itself at the time the toxæmia supervenes. It is dependent on the nature and extent of the pathological lesion in the thyreoid tissue. If damage in the gland is localized, such as is seen in the case of adenoma, the onset of symptoms is relatively slow. If there is extensive fibrosis or degenerative change in the gland tissue, as a result of some long-

continued systemic infection, for example, from teeth, tonsils, accessory nasal sinuses *et cetera*, toxic symptoms may supervene without apparent enlargement of the gland. These cases usually occur about the third, fourth or even fifth decades of life and symptoms as a rule are slow in onset and development unless some recent abnormal stimulus, for example, sudden nervous shock, acute sepsis, has led to an exacerbation due to an unusual demand in the gland which its defective mechanism is unable to cope with.

It is uncommon to meet with exophthalmos in these secondary cases and, if it does occur at all, it is not very marked and will always clear if prompt surgical treatment be instituted.

Myxœdema.

Congenital Myxœdema.

Myxœdema may be congenital or acquired. The congenital condition gives the child a dull, apathetic appearance, the hair is coarse, dry and scanty, the face is swollen and the body tissues thick and dry. The eyelids are baggy, the lips thick, the nose broadened and the tongue projects between the lips. Both growth and mental development are retarded, the bones ossify slowly and pads of fat develop above the clavicles. A well developed case is unmistakable, but in the earlier stages it may be difficult to differentiate from mongolism. The slanting, close-set eyes, shortened little finger, laxity of the joints, the foreshortened head and softer tissues of the mongol are helpful points in diagnosis. Achondroplasia should not be confused with myxœdema, as the intelligence is normal and the shortness of stature is in the limbs only.

Adult or Acquired Myxœdema.

In adult or acquired myxœdema alteration of the face is definite. The nostrils widen, the lips thicken, the lines of expression disappear and the whole face becomes heavy. All the subcutaneous fat increases and the individual becomes lethargic. Memory is defective and the cold is felt keenly. The skin is dry, the hair falls and becomes coarse, the hands and feet enlarge. Patients with this condition are thought at times to be suffering from chronic nephritis, but examination of the urine and tests of renal efficiency should readily exclude this condition.

Malignant Disease.

Carcinoma of the thyreoid gland is relatively uncommon and sarcoma still more so. These new growths are much more likely to supervene on an old adenoma than to be primary in the gland. In one case seen recently increase in size of a goitre of twelve years' standing had occurred. Upon examination after removal both sarcomatous and carcinomatous changes were evident in the tumour. Pain, rapid increase in size and fixity are the cardinal points in diagnosis. As the condition advances it produces further symptoms by infiltrating the trachea, œsophagus or adjacent nerves. The final stages are pitiable in the extreme.

Inflammatory Changes.

Acute Inflammatory Changes.

An acute inflammatory condition is usually met with secondarily to some general infection, as typhoid fever, influenza or other blood-borne conditions. Intense pain and tenderness are complained of very early and the head and neck are held rigid. Swallowing increases the pain and there may be associated tracheitis with cough and hoarseness. Acute inflammation and abscess formation are much more likely to occur in a cysto-adenoma than in the normal gland.

Chronic Inflammatory Changes.

Chronic inflammatory changes resulting in round cell infiltration of the gland and generalized fibrosis is of common occurrence and may result in either secondary thyreotoxicosis or in myxœdema. Chronic streptococcal infection is the most usual, but syphilis may play a part.

A rare form of chronic thyreoiditis (Riedel's struma) has been described in which the gland becomes very hard, resembling malignant disease, especially as it may cause pain and dyspnœa. Its ætiology is unknown and differentiation from primary carcinoma of the gland is extremely difficult, except that there is no infiltration of the surrounding tissues and the progress of the disease is slow.

HUGH R. G. POATE,
M.B., Ch.M. (Sydney), F.R.C.S. (England), F.C.S.A.,
Honorary Surgeon, Royal Prince Alfred Hospital, Sydney.

British Medical Association News.

SCIENTIFIC.

A MEETING OF THE VICTORIAN BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at the Melbourne Hospital on May 21, 1930. The meeting took the form of a series of clinical demonstrations by the members of the honorary staff.

Diabetes Mellitus and Toxic Goitre.

DR. KONRAD HILLER showed a patient who had complained of giddiness, trembling, tiredness and dyspnœa for eight months and of excessive thirst and hunger and of passing large quantities of urine for three weeks.

The patient was a married woman, aged forty-nine years. She stated that thirteen years previously a goitre had developed which was accompanied by palpitation. This had been treated medically and the swelling in the neck had subsided. For eleven years she had suffered from a prolapsed uterus, for relief from which she had come to the hospital. It was found that besides the above symptoms the patient always felt hot, so that she found that she required less bed clothes than formerly. The skin, too, had become moist and there was throbbing in the neck and abdomen.

On examination her temperature had been 37·5° C. (99·6° F.), the pulse rate 132, the systolic blood pressure 165 and the diastolic pressure 90 millimetres of mercury. The specific gravity of the urine had been 1030 and it had contained a large amount of sugar and acetone, but no diacetic acid. The heart, lungs and abdomen had been normal. A small adenoma had been palpable in the thyreoid gland on the left side, lying between the isthmus and the lateral lobe, the latter being also slightly enlarged. There had been definite tremor of the hands, but no exophthalmos or other eye signs. A sugar tolerance test had given a typical curve of *diabetes mellitus*, the blood sugar rising from 0·22% to 0·43% in ninety minutes and falling to 0·37% in 120 minutes. The basal metabolic rate had been + 47%.

The patient had been put to rest and placed on a basal diet. After fourteen days the basal metabolic rate had fallen to + 19%. All tremors had disappeared, but sugar and acetone had still been present in the urine and the resting blood sugar had been 0·18%.

The condition was regarded as one of *diabetes mellitus* complicated by a toxic goitre. It was intended to render the patient sugar and ketone free by diet and "Insulin" and then to advise removal of the adenoma.

Aleuchæmic Leuchæmia.

Dr. Hiller's second patient was a male, aged fifty-eight years, who complained of progressive pallor, weakness and dyspnœa for the last six months. He stated that he had contracted malaria in New Guinea in 1917. He had been treated with quinine for some months and did not think that there had been a recurrence, though latterly he had felt feverish.

In January, 1928, he had been crushed by a motor car and operated on in the Melbourne Hospital for an injury to the abdomen. The records of the hospital showed that there had been a mesenteric hæmatoma along the whole

length of the ileum. The spleen had been intact and not enlarged. The liver had also been unaffected; it had been small and the division between the lobes accentuated, resembling a split liver. He had lost 12·6 kilograms (two stone) in weight after his operation, but had regained it. In the last six months, however, there had again been a loss of weight.

On examination he was seen to be icteric and anæmic. His temperature was 38·9° C. (102° F.), his pulse rate 96 and respiratory rate 26. There was a soft systolic murmur at the apex of the heart, but no cardiac enlargement. The bases of both lungs were somewhat dull and coarse and fine moist sounds were heard over this area. There was some œdema of both legs.

In the abdomen there was a large incisional hernia. The spleen was much enlarged, the anterior border reaching to half way between the costal margin and the umbilicus. Its surface was smooth. The liver was enlarged downwards to two finger breadths below the costal margin.

An enlarged gland in the left axilla had been excised and examination revealed chronic inflammation; this was thought to be due possibly to Hodgkin's disease, though the appearance was not typical.

The Van den Bergh test had given a delayed positive reaction. Both the Casoni and Wassermann tests had yielded no reaction.

On X ray examination moderate diaphragmatic movement, greater on the right side than on the left, had been present.

Blood examination had yielded the following results:

Red corpuscles, per cubic millimetre ..	2,900,000
Hæmoglobin value	47%
Colour index	0·8
Leucocytes, per cubic millimetre	5,700

A stained film had shown no great deviation from normal of the erythrocytes.

The differential count of the white cells had been as follows:

Neutrophile polymorphonuclear cells ..	24%
Eosinophile polymorphonuclear cells ..	1%
Old metamyelocytes (band forms) ..	22%
Young metamyelocytes	1%
Myeloblasts	4%
Monocytes, small mononuclear cells ..	43%
Lymphocytes, large	5%

There had been no increased, but rather a decreased, fragility of the red cells.

Dr. Hiller said that the patient had continued to run a daily temperature up to 38·3° C. (101° F.) while these investigations were being carried out. He was disinclined to a diagnosis of Hodgkin's disease, but was of the opinion that if there was no response to malarial treatment, the patient was probably suffering from aleuchæmic leuchæmia.

Myxœdema.

DR. F. BLOIS LAWTON showed a female patient, aged fifty-five, who had been admitted to the hospital on May 2, 1930. The past history revealed that the patient had been perfectly well three years previously. She then complained of swelling of the vulva and pruritus which lasted two months. She had also had great thirst which was present till three months previously. Eighteen months before she had had polyuria and severe pain in the right arm and left leg. The pains had been sharp and shooting in character. There had recently been numbness and tingling in the feet. She also complained of swelling of hands and feet and puffiness of eyes. Recently she had had tiredness and general malaise and her hair had been falling out. She had lost 6·3 kilograms (one stone) in weight in the last year. Her appetite had been good and her bowels regular. Past and family history were not important.

On examination at the time of admission the patient's temperature had been 36·7° C. (98° F.), pulse rate 72 and respiratory rate 20. Her general appearance had been typical of myxœdema. Her arteries were slightly thickened and blood pressure had been 170 millimetres of mercury systolic and 90 millimetres diastolic. The apex beat had been in the sixth intercostal space 13·75 centimetres (five and a half inches) from the mid-sternal line. No right cardiac dulness had been found. There had been a slight blurring of the first sound at the apex. The specific gravity of the urine had been 1020, its reaction acid; it had contained a trace of albumin. A definite reaction for sugar had been obtained. Acetone had been present, but no diacetic acid. The hands had been swollen and not pitted, the eyelids had been swollen. The skin had been dry and coarse and the hair dry. The joints had manifested no abnormality. The weight had been 61·6 kilograms (9 stone eleven pounds). The blood sugar had been 0·25%. The basal metabolic rate had been – 25%. The blood urea had been 31 milligrammes per 100 cubic centimetres of blood. The Wassermann test had failed to yield a reaction.

Thyreoid extract had been given in doses of 0·015 gramme (one-quarter of a grain) twice a day and this had gradually been increased to 0·03 gramme three times a day. On May 14 the basal metabolic rate had been – 15%. Five units of "Insulin" had been given before the evening meal on May 12.

"Insulin" had been increased to ten units night and morning on May 15. The blood sugar on May 3 had been 0·21% and on May 18 0·23%. The weight was 60·3 kilograms (nine stone eight pounds). Urinary sugar had disappeared while the patient was on diet, but had reappeared in the 6 a.m. specimen of urine. No recurrence had taken place with twenty units of "Insulin." No symptoms of hyperthyreoidism were present. The pulse was regular at 72 per minute. An occasional rise of temperature occurred.

Dr. Lawton said that small doses of thyreoid extract were given because myxœdematous patients are often sensitive to it. In this case a comparatively small dose had been required to restore the patient to an almost normal condition and it was probable that a maintenance dose of 0·06 gramme (one grain) a day would be sufficient.

DR. S. V. SEWELL expressed his approval of this method of treatment and he described a case in which the patient had been very well for some months on a small daily dose of thyreoid extract. The patient had gone to another State and had been given a greatly increased dose with disastrous results.

Pott's Disease.

DR. C. W. B. LITTLEJOHN showed a female patient, aged nineteen, who had suffered from Pott's disease. The past history revealed that she had had pain in the back for four years. X ray examination had revealed destruction of cartilage between the fourth and fifth lumbar vertebræ and destruction of adjacent bone. This was a good example of the disease commencing in the cartilage. An Albee graft operation had been performed on June 11, 1929. The patient had got up in twelve weeks and was wearing a brace. The present condition was good, but the patient still wore a brace for part of each day. X ray films were shown.

Epithelioma.

Dr. Littlejohn's second patient was a girl, aged sixteen, who was suffering from what was regarded as blastomycosis. She had had a small pimple on the left internal malleolus and this had rapidly developed into a large ulcer. There was a four months' history. The Wassermann test yielded no reaction. A section taken from the edge had been reported as epithelioma. No fungus had been detected on bacteriological examination. The ulcer had become smaller under the protection of Unna's paste. The patient had been taking potassium iodide 12 grammes (180 grains) per day.

Periarterial Sympathectomy.

Dr. Littlejohn's third patient was a woman, aged eighty-five years, who had undergone periarterial sympathectomy for causalgia and ulcer. She had had a small varicose ulcer on the outer side of the leg and severe pain in the distribution of the peroneal nerve and par-

ticularly between the first and second toes. No pulsation had been detected in the popliteal artery by palpation or manometer.

Operation had been performed on September 28, 1929, under local anæsthesia and periarterial sympathectomy in Hunter's canal performed. After the operation the pain had disappeared and it had not returned. The ulcer had healed within three weeks.

Campbell's Operation for Dangle-Foot.

Dr. Littlejohn also showed a patient who had undergone Campbell's operation for dangle-foot. The scaphoid had been removed; arthrodesis of the calcaneo-cuboid joint had been performed and the surfaces of the astragalus and cuneiform bones bared. The bone removed and denuded of cartilages had been built into a block and mortised into the calcaneus behind the tibia. It formed a bone block to prevent plantar flexion at the ankle joint. The tarsal arthrodesis prevented dropping of the forefoot. X ray films were shown.

Thoracoplasty.

Dr. Littlejohn's last patient had been treated by thoracoplasty for pulmonary tuberculosis. The past history revealed old tuberculosis of the right lung which had become active in July, 1928. Tubercle bacilli had been present and the diagnosis had been confirmed by X rays.

The patient had been treated for pyopneumothorax from November, 1928, to May, 1929. Progress had been partially arrested, but the upper lobe had not been controlled. There had been cavitation in the upper lobe and adhesions. X ray films were shown.

Thoracoplasty had been done in two stages, under ethylene and oxygen anæsthesia given by the intratracheal method, in June and July, 1929. Since then the patient had put on 6·3 kilograms (one stone) in weight. Very little sputum was obtained and the patient had no rise in temperature. The cavities appeared to have collapsed. X ray films were shown.

Lesions of the Retina.

DR. LEONARD MITCHELL showed two patients with lesions of the retina. One was seventy years of age and had had partial thrombosis of a branch of the right retinal artery; almost complete recovery had occurred.

The second patient was forty-five years of age and had an enlarged heart, aortitis, gross arteriosclerosis and retinitis which showed retinal œdema, periarterial sheathing, hæmorrhages and exudates.

Gastric Carcinoma.

DR. IVAN MAXWELL showed a male patient, aged fifty-seven years, who had reported to the Melbourne Hospital in June, 1929, complaining of flatulence, loss of weight and dyspnœa. He had noticed that his skin had been yellow for two months. Apart from slight œdema of his legs and a lemon yellow colour of the skin, nothing abnormal had been revealed on physical examination. The Wassermann test had yielded no reaction. The fractional test meal had revealed no free hydrochloric acid, but lactic acid had been present and a little blood had been found both in the fasting contents and in all the samples aspirated. The following blood report was obtained: Red cells, 3,780,000 per cubic millimetre; white cells, 4,500 per cubic millimetre; hæmoglobin value, 40%; colour index, 0·53. Anisocytosis had been present and the reticulocytes had been increased to about 2%. No nucleated red cells had been seen. The differential white count had indicated an increase of young and old metamyelocytes and some diminution in the neutrophile polymorphonuclear cells.

A barium meal had revealed no organic lesion, but slight delay in emptying of the stomach. Cholecystograms following the oral administration of "Shadocol" revealed no dye in the gall bladder. Investigation of the nose and throat had revealed no septic focus and a culture of the fæces had contained no pathogenic organisms. Some slight dental sepsis had been attended to.

Four cubic centimetre (one fluid drachm) doses of dilute hydrochloric acid and increasing doses of *liquor arsenicalis* had been administered and the patient had eaten liver supplemented with liver extract. Despite these measures his hæmoglobin value was still 40% on December 21, 1929, and had fallen to 26% with a colour index of 0·43 on April 25, 1930. A barium meal at this stage had revealed a narrowing of the distal 2·5 centimetres (one inch) of the stomach with a filling defect on the lesser curvature and definite delay in emptying of the stomach. The condition was regarded as a gastric carcinoma. Operation had been refused by the patient. Dr. Maxwell said that a feature of special interest in the investigation of this man's illness had been the discovery of lactic acid and blood in the stomach contents at a time when the X ray report indicated no organic lesion to be present.

Syphilis of the Lung.

Dr. Maxwell's second patient was a male, aged forty-seven years, who had reported to the Melbourne Hospital in October, 1929. For six months he had had wheezing, cough, with thick yellow sputum and slight hæmoptysis. Not much loss of weight had occurred and he had had no sweats. Physical examination had revealed an impaired percussion note in the right lower interscapular region with bronchial breathing, pectoriloquy, râles and crepitations. No tubercle bacilli had been found in his sputum on repeated examinations. The Casoni test had given no reaction and his temperature had been normal. The response to the Wassermann test had been strongly positive. X ray examination revealed an area of dulness posteriorly in the right lower lobe of the lung, not homogeneous, and with lobulated areas in the lower part. It had been regarded either as syphilitic or a neoplasm. Antisyphilitic treatment had been commenced. Ten injections of "Muthanol" had been given, followed by injections of "Novarsenobillon" and in addition the patient had been given mercury and iodides. His general health had definitely improved under treatment, the physical signs in his chest had diminished and a recent X ray investigation had shown the pathological process to be much more circumscribed than when the patient first came under observation. The X ray appearance of the lesion and the positive Wassermann reaction, coupled with his response to antispecific treatment, indicated that the condition was one of syphilis of the lung.

Mitral Stenosis.

Dr. Maxwell's third patient was a male, aged twenty-two years, who had been admitted to Melbourne Hospital on December 15, 1929.

The patient had had tonsillitis in childhood and tonsillectomy had been performed when he was fourteen years of age. Since then until the present illness he had been very well and until recently he had indulged in running as a recreation. Some two months previous to admission to hospital he had had a coryza and this had soon been accompanied by dyspnœa on exertion and epigastric pain. Swelling of the ankles had been noticed and three weeks before attending the Melbourne Hospital he had been in bed for seven days on account of dyspnœa. He had been admitted to Dr. Turnbull's ward on December 15, 1929, and some weeks later had come under Dr. Maxwell's care. On admission the apex beat had been found in the sixth intercostal space 11·25 centimetres (four and a half inches) from the mid-line, with 2·5 centimetres (one inch) right cardiac dulness. The heart beat had been rapid (115) and irregular in rhythm. Mitral systolic and diastolic bruits had been present and a definite diastolic thrill had been detected. The other valvular areas had been clear. Apart from some œdema of the ankles, no other abnormalities had been found. The blood pressure had been normal and the Wassermann test had yielded no reaction. The administration of tincture of digitalis in doses of two cubic centimetres (thirty minims) every six hours had been immediately commenced. Two days later an electrocardiogram had revealed typical auricular flutter and this had still been present on December 20, 1929, despite the continued use of digitalis. The pulse rate was at this

time 80 and the dosage of digitalis had been diminished. Flutter had still been present on January 2, 1930, but by January 13, 1930, coarse fibrillation had developed. On January 14, 1930, a preliminary dose of 0·3 gramme (five grains) of quinidine had been given, to test idiosyncrasy to the drug. The dose had been well tolerated and the following day a course of quinidine therapy (0·3 gramme three times a day) had been initiated. Within forty-eight hours an electro-cardiogram had shown the rhythm to be normal. Since January 17, 1930, the patient had taken quinidine 0·3 gramme twice daily till two weeks before and he was having 0·3 gramme as a single dose once a day. The signs of mitral stenosis were present, but the rhythm had been normal for four months and the patient felt exceedingly well.

Asthma.

Dr. Maxwell's last patient was a man, aged twenty-one years, who was a cabinet maker and who complained of attacks of asthma which occurred whilst at work with myrtle wood. These attacks had been intermittent for two months. There was no family history of asthma or other allergic disease. Physical examination of his lungs had revealed only a few scattered rhonchi. A fractional test meal had revealed normal acidity. The *P-R* interval had been slightly prolonged in an electrocardiogram. X ray examination of his nasal sinuses and antral lavage had not revealed any sinus infection. A sterile extract of myrtle wood dust had been prepared by Dr. Lucy Bryce who used Coca's solution as the extracting agent, and intradermal tests with this extract gave a wheal with surrounding erythema of thirty millimetres in diameter. The control test produced no reaction. It was found that the patient was free from asthma if he did not work with myrtle wood, but as he was very anxious not to change his occupation, an attempt was being made to desensitize him to myrtle wood dust. His attacks of asthma were controlled by oral administration of ephedrine. During the process of desensitization he was being kept away from his occupation. Dr. Maxwell said that the specific character of the sensitization was worthy of note.

Artificial Pneumothorax in the Treatment of Bronchiectasis.

DR. L. E. HURLEY showed a female patient, aged twenty-two, who had been admitted to the out-patient department on July 27, 1929. She had had measles and whooping cough as a child. As far back as she could remember she had had a cough and for years had been bringing up about half a cupful of purulent sputum every day. Her appetite had been good and she had lost no weight.

On examination there was slight clubbing of the fingers. The face was broad, the cheeks were slightly cyanotic. There was moderate dulness with numerous râles and rhonchi over the base of the right lung posteriorly. X ray examination after the injection of "Lipiodol" revealed a number of small bronchiectatic cavities at the base of the right lung and about midway between the spine and the lateral chest wall. The remainder of the lungs, both to clinical and to radiological examination, showed nothing abnormal.

As the disease was unilateral and not affecting the main bronchi near the hilus, it had been thought that pneumothorax therapy would be beneficial. Collapse of the lung had been successfully performed, with the result that the cough and sputum had almost disappeared. Refills were being given at intervals of about three weeks and it was proposed to keep the lung collapsed for approximately two years.

The following points were discussed: (i) The prevention of bronchiectasis by careful after-treatment of lung infections, particularly broncho-pneumonia following measles, whooping cough and influenza; (ii) bronchoscopic drainage which had not proved very satisfactory in several cases so treated; (iii) the medical treatment of bronchiectasis which on the whole was not very effective; (iv) the treatment of unilateral infections with established disease. Pneumothorax, with or without phrenic avulsion, was advised for early and milder cases, especially if the dilatations were not too near the hilus of the lung; graded thoracoplasty was advised for advanced cases.

"Insulin" Fat Atrophy.

Dr. Hurley's second patient was a female, aged twenty-six, who had been receiving injections of "Insulin" for about four years. About two years previously it had been noticed that after "Insulin" had been injected in one region for approximately two months, the subcutaneous tissue below the site of the injections atrophied. Many depressed areas were present on the skin, varying in diameter from 2·5 to 5·0 centimetres (one to two inches), and extending deeply to the underlying muscles.

The skin complications of diabetes were briefly discussed. It was also mentioned that the percentage of sugar in the skin, unlike that in the other tissues, rises and falls with the blood sugar, although it is always slightly less.

Subacute Combined Degeneration of the Spinal Cord.

Dr. Hurley's next patient was a man, aged fifty-five, who had been admitted to the out-patient department on May 2, 1930. In the past nine months he had had intermittent attacks of sore mouth and tongue. Five months previously he had noticed numbness and tingling in the hands and feet and these had persisted. A month before he had had a fainting turn and since then he had felt tired and lacking in energy. In the past few weeks he had noticed slight clumsiness in the use of his hands and some awkwardness in his gait. His appetite had been good and he had lost no weight. His bowels had been regular and he had had no indigestion. He said that his complexion had always been sallow.

On examination there was slight pallor with a definite lemon yellow tinge. The tongue was clean and the margins red and slightly inflamed. The deep reflexes in both upper and lower limbs were equal and active. The plantar reflexes were flexor in type. The superficial abdominal reflexes were present and equal. In the upper limbs there was slight astereognosis and some ataxia in the performance of finer movements was present. In the lower limbs there was definite impairment in ability to recognize alterations in joint position and finer degrees of muscle movement. The gait was slightly ataxic, especially with the eyes closed. No loss of sensation to vibration, pinprick, or light cotton wool touch could be detected. A fractional test meal had been done and no free hydrochloric acid had been detected in the gastric juice.

An examination of the blood gave the following results:

Erythrocytes, per cubic millimetre ..	2,680,000
Hæmoglobin value	75%
Colour index	1·4
Leucocytes, per cubic millimetre	5,100

Red cells showed well marked macrocytosis, some microcytes were present and no nucleated red cells were seen. There was no increase of reticulocytes.

The differential white count was as follows:

Neutrophile polymorphonuclear cells ..	71·5%
Metamyelocytes (old)	0·5%
Young metamyelocytes	2·5%
Large mononuclear cells	3·5%
Lymphocytes	22·0%

The patient was exhibited as suffering from typical subacute combined degeneration of the cord with pernicious anæmia.

The following points were discussed: (i) The early onset of features which were usually one or more of the following: Numbness in the hands and feet, weakness, stiffness or clumsiness in the legs, occasionally unilateral, alimentary symptoms (indigestion, diarrhœa, sore tongue) and symptoms due to anæmia; (ii) the very occasional development of nervous features in a patient already under observation for anæmia; (iii) the technique and results of liver treatment. It was usually necessary to give the equivalent of 0·34 kilogram (three-quarters of a pound) of liver every day, partly in the form of fresh liver and partly as liver extract. There was often a definite improvement in symptoms, but physical signs as a rule remained unaltered; (iv) failure to respond to treatment was usually due to the pressure of some complicating infection or to the administration of insufficient amounts of liver.

Recurring Renal Œdema.

Dr. Hurley also showed a male patient, aged thirty-two, who had been admitted as an in-patient to the Melbourne Hospital on March 30, 1930. He had had measles as a child and in 1921 malignant malaria. In 1923 he had had an attack of renal œdema which had cleared up after three months' rest and treatment in another hospital. He had remained well until the early part of 1929, when he had a second attack of renal œdema lasting only a fortnight; after this he had felt well and had returned to work. The œdema had recurred again in March, 1929, and had disappeared after about three months. In December, 1929, he had felt well, but his urine had contained a large amount of albumin and numerous granular and epithelial casts. He had refused admission to hospital as an in-patient. In the early part of March, 1930, slight puffiness beneath the eyes and around the ankles had been noticed and he had been again unable to accept in-patient treatment until March 30, 1930, when he had been admitted to the wards. At this time there had been a moderate grade of œdema about the face and in the legs. The systolic blood pressure had been 130 and the diastolic 90 millimetres of mercury. The urine had a specific gravity of 1030, was acid and contained a large amount of albumin with a moderate number of epithelial and granular casts. There had been 50 milligrammes of urea per 100 cubic centimetres of blood which had also shown marked lipæmia. In the first, second and third hour specimens of urine in the urea concentration test the percentage of urea had been 3·8, 3·8 and 3·9 respectively. The *fundi oculorum* had shown nothing abnormal. X ray examination of the nasal sinuses had revealed a thickening of the lining membrane of both maxillary antra, more pronounced on the right side. The tonsils appeared normal. On the right side of the naso-pharynx was a small cyst, the origin of which could not be determined.

Treatment had been commenced with a high protein, low fat diet (protein 140, fat 30, carbohydrate 180), restriction of salt, limitation of fluid to 1,200 cubic centimetres daily and thyreoid extract 0·06 gramme (one grain) three times a day. The œdema had then disappeared. On April 15, 1930, a right radical antrum operation had been performed. The œdema had recurred and, despite treatment, had gradually increased until it became gross with a large amount of fluid in the peritoneal and both pleural cavities. Restriction of fluids and salt and a high protein, low fat diet had again been continued as before. Theocin 0·3 gramme (five grains) three times a day for six doses produced a slight diuresis. Urea in doses of one gramme (fifteen grains) three times a day had temporarily increased the excretion of urine, but the patient had still remained considerably œdematous. On May 4, 1930, he had been placed on a purely milk diet (1,300 cubic centimetres every day) with "Diuretin" 0·6 gramme (ten grains) five times a day. This resulted in a moderately good diuresis, but only slight reduction of the œdema. On May 12, 1930, the high protein, low fat diet had been reverted to and the "Diuretin" continued as before. Immediately after this he had begun to pass over three litres (one hundred ounces) of urine every day and the œdema had rapidly diminished, with accompanying improvement in his feeling of well being. "Novasural" was to have been administered, but had been withheld when free diuresis had occurred.

The following points were discussed: (i) The tendency to recurrence in cases of subacute and chronic renal disease with œdema and the consequent importance, in the first attack, of removing focal infection and keeping the patient at rest in bed for a prolonged period, long after the œdema had disappeared and preferably until the urine was free from albumin, blood and casts. (ii) The diagnosis between subacute nephritis and nephrosis. It was thought that, owing to the high blood fat, the comparative absence of red blood corpuscles from the urine, the normal blood pressure and the absence of impairment to renal function tests, the patient presented belonged to the nephrotic group. (iii) The management of renal œdema. (iv) The apparently spontaneous onset of diuresis when most of the usual diuretic measures had been tried with only partial success. (v) The possible relationship of the malarial infection to the renal condition.

Pernicious Anæmia.

Dr. Hurley's last patient was a married woman, aged fifty-two, who had been admitted to the out-patient department on May 7, 1930. In December, 1929, she had had a sore mouth and tongue and about the same time an attack of diarrhœa, the fæces containing no blood or slime. In the past six weeks she had complained of rapidly increasing weakness and pallor, with occasional attacks of palpitation. She had lost 0·45 kilogram (fourteen pounds) in weight. Her appetite had been poor for several weeks and she had had slight "indigestion" for many years. Three weeks previously she had had another attack of sore mouth and tongue. She had always noticed that she bruised easily.

On examination she was fairly well nourished, but there was definite pallor with a distinct lemon yellow tinge. The tongue was clean, glazed in the centre and somewhat wrinkled at the margin. Nothing abnormal was found in the heart, lungs or abdomen. There were no signs or symptoms of involvement of the nervous system. An examination of the blood gave the following results:

Erythrocytes, per cubic millimetre ..	1,960,000
Hæmoglobin value	36%
Leucocytes, per cubic millimetre	4,200

The red cells showed marked macrocytosis. Few microcytes also were present. Poikilocytosis and slight polychromatophilia were found. Two megaloblasts were seen. There was in increase of reticulocytes. The leucocytes showed a leucopenia with relative lymphocytosis.

The differential white count was as follows:

Neutrophile polymorphonuclear cells ..	40·5%
Eosinophile polymorphonuclear cells ..	4·0%
Metamyelocytes	4·5%
Lymphocytes	51·0%

The following points were discussed: (i) The importance of symptoms in the early diagnosis of pernicious anæmia, particularly sore mouth and tongue and apparently causeless attacks of diarrhœa. (ii) One or more of the following: sore mouth and tongue, attacks of diarrhœa, slight macrocytosis, absence of free hydrochloric acid in the gastric juice, nervous features and a typical facial configuration, was often present long before the development of any evident anæmia. (iii) The methods employed in the recognition of macrocytosis and its importance in the diagnosis of pernicious anæmia. (iv) The alterations in the percentage of reticulocytes in response to liver feeding.

Purpura Hæmorrhagica.

DR. KEITH FAIRLEY showed two patients who had been subjected to splenectomy, as they suffered from *purpura hæmorrhagica*. Their histories will be fully reported at a later date.

Subthyreoidism.

Dr. Fairley also showed a patient who was treated for two years for pernicious anæmia before the correct diagnosis of subthyreoidism was made. He had seen several patients in whom this diagnostic error had resulted in incorrect treatment over long periods, such a faulty diagnosis being apparently more common than was generally recognized.

One patient, a female, aged thirty-eight, in October, 1927, had complained chiefly of aching pains in the back, neck and chest and was obviously anæmic. The pathologist had reported that the red blood corpuscles numbered 2,350,000 and the leucocytes 11,000 per cubic millimetre of blood. The hæmoglobin (Sahli) had been 63%, the colour index being 1·3. The differential leucocyte count had been within normal limits. Some very large macrocytes, a few of them showing polychromatophilic staining, had been seen. There had been very little poikilocytosis and few microcytes. The fractional test meal had revealed an achlorhydria with a low total acid content and rapid emptying of the stomach. Dilute hydrochloric acid, Fowler's solution and liver diet had been prescribed. Subsequent blood examinations on several occasions had revealed a hæmoglobin content never exceeding 70% and a

colour index ranging from 0·75 to 0·83, while the blood films showed no obvious abnormality.

Eventually it had been recognized that her facies was typical of a subthyreoid condition and direct questioning had revealed that she felt the cold intensely and that her skin, particularly about the thighs, was noticeably dry. Since her hair had been shingled nearly three years before it had grown very slowly. The basal metabolic rate had been – 23%.

It was pointed out that the hæmoglobin estimation in the original examination might have been incorrect and thus the colour index might not have been so high as was reported. The leucocyte count of 11,000 per cubic millimetre was evidence against the diagnosis of pernicious anæmia, while none of the later blood examinations gave any evidence in support of this diagnosis.

In the discussion which followed, Dr. S. V. Sewell stated that he had seen several similar mistakes in diagnosis and agreed that in clinical teaching the possibility of such an error should be emphasized.

Intrathoracic Goitre.

DR. VICTOR HURLEY showed a woman, aged fifty years, who had been admitted to hospital on November 19, 1929, with a history that she had noted a swelling of the thyreoid gland for the past twenty years which had steadily increased in size. In the last few years increasing obstruction to respiration had been noted with dyspnœa, especially at night. Acute exacerbations of the dyspnœa occurred from time to time and these had at one time been regarded as asthmatic attacks. For the last few months she had been easily tired and depressed. There had not been any great loss of weight and no serious illnesses. She had eight children alive and well. She came from a goitrous area in Gippsland.

On examination there had been an obvious large goitre fairly symmetrical on both sides of the neck. This had been irregular in outline and firm on palpation, although here and there were areas which were plastic in consistency and apparently cystic. The gland had not been adherent to surrounding structures and moved with the trachea on swallowing. There had been marked dulness on percussion behind the sternum extending down to the third rib. There had been no toxic signs or symptoms and no exophthalmos. The systolic blood pressure had been 95 millimetres of mercury and the diastolic pressure 55 millimetres. The basal metabolic rate had been + 9%. X ray examination had shown that the trachea in the neck was displaced to the right and forward, opposite the sixth and seventh cervical vertebræ, and that there was a large rounded shadow behind the sternum which extended down to the level of the aortic arch.

At operation on November 25, 1929, ether had been administered by the intratracheal method and the goitre in the neck had been removed on both sides, a small portion of the gland on each side posteriorly being left. After the blood vessels from above had been secured, the portion of the gland behind the sternum had been freed and delivered without much difficulty into the neck, where it was removed. The patient had made a good recovery and had left the hospital two weeks later, relieved of her symptoms.

The X ray films and intrathoracic portion of the goitre were shown.

Stone in Common Bile Duct.

Dr. Hurley's second patient was a woman, aged seventy-three years, who had been admitted to hospital with a history that she had been very well after an operation twelve years previously, when her gall bladder containing stones had been removed, until twelve months prior to admission. She had then had a severe attack of pain in the right upper part of the abdomen with jaundice, shivers and sweats. These attacks had since recurred at frequent intervals and for the last three months had been associated with severe vomiting and jaundice which had steadily increased, although subject to some variations in intensity. Bile in the urine had been noted and the skin had been very itchy.

On examination there had been deep jaundice and the patient had been poorly nourished. The liver had been enlarged three finger breadths below the costal margin and there had been tenderness over the right hypochondrium and over the epigastric region, but no definite rigidity.

After preliminary medical treatment, consisting of intravenous calcium injections and increased fluid and carbohydrate intake, operation under ethylene anæsthesia had been carried out four weeks previously and a large stone had been removed from a much dilated common duct which was drained and a sound had been passed into the duodenum. The patient made a good recovery.

Together with this patient was also shown another elderly female patient with an almost identical history of stone in the common bile duct ten years after cholecystostomy and removal of gall stones from the gall bladder. A similar procedure to the previous case had been carried out two weeks previously and this patient was also doing well.

It was pointed out that these two patients illustrated the length of time which might elapse after an operation for stones in the gall bladder before stone in the common bile duct produced symptoms. In one case after cholecystectomy and in the other after cholecystostomy probably the stones had formed in the smaller intrahepatic ducts.

Ununited Fracture of the Tibia.

Dr. Hurley also showed a male patient, aged thirty-two years, who had been admitted on August 24, 1929, with a compound fracture of the right tibia and fibula, the result of a motor car accident. The fracture had been cleaned up in the normal way under a general anæsthetic and placed on a Thomas's splint. There had been no difficulty in securing and maintaining good apposition of the fragments which were not comminuted nor severely damaged. Primary union of the wound had occurred. Progressive X ray films were shown and these demonstrated that although good position was maintained, no firm bony union of the tibia had been present after six months, although the fibula united early, as was usually found in these cases. Plaster casts and Delbet's walking plaster had also been applied.

On April 7, 1930, a sliding bone graft operation had been performed and a plaster mould applied which was still in position. A recent X ray picture taken through the plaster seemed to show that consolidation of the fracture was occurring.

It was pointed out that in this case it had been confirmed at the second operation of bone grafting that the two fragments of tibia were in good alignment and only separated by a space of six millimetres (one-quarter of an inch) of fibrous scar tissue, yet this gap had not been bridged in seven and a half months. It was suggested that the early union of the fibula in such cases was the probable cause of non-union of the tibia in that it prevented the end-to-end contact of the tibial fragments which was a powerful stimulus to the formation of callus. In some cases it seemed that excision of a small portion of fibula to permit contact of the tibial ends was all that was necessary for union of the tibial fracture to take place.

Hydatid of the Lung.

Dr. Hurley's next patient was a woman, aged thirty-five years, who had been admitted to hospital on December 16, 1929, with a history of breathlessness, palpitation and chronic cough with occasional slight hæmoptyses for the last fifteen years. For the last six months the breathlessness had increased and five weeks previously she had had an acute attack of nausea and vomiting with pain at the base of the right lung. There had been a slight hæmoptysis eight days before admission. On examination an extensive area of dulness on percussion had been found at the base of the right lung with absence of breath sounds, local resonance and fremitus. There had been no demonstrable displacement of the heart, either on clinical examination or in the X ray films which showed a large rounded shadow at the right base near the posterior wall of the thorax. Neither the Casoni test nor the hydatid complement fixation test had yielded a reaction.

Operation had been carried out on December 23, 1929. Ethylene was administered by the intratracheal method and 12·5 centimetres (five inches) of the ninth rib in the posterior axillary line resected. A large hydatid cyst in the lower lobe of the right lung had been exposed immediately beneath the incision in the parietal pleura. There were no adhesions. The pleural cavity had been packed off all round the cyst with a double layer of packs and the cyst incised and emptied by a suction apparatus of two to three pints of clear fluid. The lining membrane of the hydatid had been removed intact. There had been no daughter cysts. Ethylene had escaped freely from the thoracotomy wound, showing that the cyst communicated with a bronchus. A rubber drain tube had been inserted into the cavity occupied by the cyst and the edges of the incision in the cyst sutured closely to the edges of the wound in the thoracic parietes. Infection of the pleural cavity had developed during the next few days and pyopneumothorax had resulted. This was well shown in the X ray films.

After a stormy convalescence the patient had recovered and was now well enough to leave the hospital. The wound had been well healed for two weeks and all signs of infection had subsided. It was pointed out that this case showed the risks of infecting the pleural cavity in operations for hydatid of the lung. The possibility of operating in two stages had been considered and discarded, as it did not appear that a satisfactory exposure of the cyst at a second operation would have been possible. The failure to obtain reactions with the Casoni and complement fixation tests had also been noted in two other recent cases of hydatid of the lung, proved at operation. Possibly small ruptures with hæmoptyses prior to operation had produced desensitization.

Adeno-Carcinoma of Recto-Sigmoid Junction.

Dr. Hurley's next patient was a married woman, aged fifty-nine years, who had been operated on in the hospital by another surgeon for acute intestinal obstruction two years previously. Symptoms of a tumour of the large bowel had been present for some months before this. At the operation a hard mass, the size of a billiard ball, had been found at the recto-sigmoid junction. This was fixed to surrounding structures and had been regarded as inoperable. A transverse colostomy had been done because the sigmoid had a short mesentery and could not be delivered comfortably into the wound. The patient had recovered and had been discharged from hospital with a colostomy belt. She had not returned to the hospital till a few days previously when she presented herself because of a "rupture" at the site of the colostomy which at times was as large as a small football and could not be contained in the colostomy appliance. She had gained 18·9 kilograms (three stone) in weight and had looked and felt very well and had only desired treatment for her "rupture." On examination a mass had been found to be still present at the original site and so far as could be determined by bimanual, rectal and vaginal examination under an anæsthetic, was movable. X ray examination showed a complete absence of filling by the opaque solution of 5·0 to 7·5 centimetres (two to three inches) of the bowel at the recto-sigmoid junction. Sigmoidoscopic examination revealed a fungating ulcer, readily bleeding and typically carcinomatous in appearance. A small portion of this ulcer had been removed through the sigmoidoscope and microphotographs of sections of the tissue removed were shown. They were characteristic of adeno-carcinoma.

Dr. Hurley said that the interest of the case was the definite improvement after colostomy of a patient with carcinoma of the sigmoid which had probably been present for about three years. It was practically certain that the fixed mass two years previously was then a carcinoma, yet now it seemed movable and operable. The patient, however, declined further operation for this when it was pointed out that repair of her colostomy was not possible. A further point of interest which was readily demonstrated, was that the "hernia" at the site of colostomy was really an intussusception of the transverse colon proximal to the colostomy opening and through the latter.

Perforated Carcinomatous Ulcer of the Jejunum.

Dr. Hurley's last patient was a man, aged fifty-four years, who had been admitted to hospital in the early hours of the morning of April 5, 1930, with a history of abdominal pain which began about fifteen hours previously. This pain had not been very severe at its inception and had been noted round about the umbilicus and lower part of the abdomen generally. He had vomited several times. His pain had increased in severity and by the time he was admitted to hospital had been very severe and generalized. He had not had any previous similar attacks, although he admitted to some vague dyspepsia off and on for years past, particularly some months before, but this had been better of late. He had been a few pounds below his normal weight and there had been no other evidence in his history of any abnormal symptoms.

On admission his temperature had been 37·2° C. (99° F.) and his pulse rate 88. There had been board-like rigidity of the whole abdomen with some dulness in the flanks. A diagnosis of perforated duodenal ulcer had been made and immediate operation carried out. On opening the abdomen free fluid with much lymph had been found. No free pus had been observed. The appendix had been normal and a small scar of an old healed duodenal ulcer had been present at the usual site on the anterior wall, 12 to 18 millimetres (one-half to three-quarters of an inch) beyond the pylorus. There had been no leak here nor of the stomach on either its anterior or posterior surfaces, the latter having been explored through an opening into the lesser sac. The peritonitis had been most severe in the upper part of the abdomen on the left side and on following down the jejunum at a point about thirty centimetres (twelve inches) below the duodeno-jejunal flexure a ring carcinoma had been found which had perforated through an opening six millimetres (a quarter of an inch) in diameter. The tumour, together with 10·0 to 12·5 centimetres (four to five inches) of the bowel and below, had been resected and end-to-end anastomosis of the divided ends carried out. The abdomen had been closed without drainage.

Contrary to expectations, the patient had made an unusually smooth recovery, the only incident being a stitch abscess in the wound which delayed healing for a few days. He had been discharged from hospital a few days before the meeting.

The specimen of bowel removed was shown, together with microphotographs of sections of the ulcer which proved to be an active looking adeno-carcinoma.

It was pointed out that carcinoma of the small bowel is in itself exceedingly rare and that a perforation of a carcinoma in this situation is still more unusual. Dr. Hurley said that the good result in this case was in marked contrast to the results of perforated carcinomata of the colon which were almost uniformly fatal, owing to the greater infectivity of the colonic contents.

Diaphragmatic Hernia.

DR. W. ALLAN HAILES showed a male patient, aged forty-three years, who had been admitted to hospital on February 11, 1930. The patient had been wounded in the chest with shrapnel in 1915. Eleven months prior to admission he had suffered from acute intestinal obstruction and a left-sided diaphragmatic hernia had been discovered. Anastomosis had been performed in another hospital between the transverse and the descending colon.

Five weeks prior to admission he had strained his back by heavy lifting. Two weeks later he had fainted and become short of breath. Four days before admission he had suffered from diarrhœa and since then had had a painful, full feeling below the left costal margin, relieved at times by a feeling that gas had got away. Eighteen hours before admission he had complained of colicky pain in the mid-epigastric region and had commenced to vomit. He had vomited several times since and had passed no flatus. On his admission the abdomen had not been distended and there had been no tenderness. An indefinite mass had been palpable in the abdomen, running from below and upwards to the right of the umbilicus; it had felt like distended bowel. Subsequently abdominal dis-

tension had occurred, but neither pain nor vomiting had been present. A barium enema had revealed hypertrophy and dilatation of almost the whole of the transverse colon which was lying in the left pleural sac. A small hernial opening through the diaphragm had been evident. On February 17, 1930, the hernia had been exposed by transpleural operation and returned to the abdomen; the opening in the diaphragm had been repaired. Intratracheal administration of ether had been adopted.

Scar Contracture of the Face.

Dr. Hailes also showed a male patient, aged sixty-two years, who had been operated upon by him four years previously for epithelioma of the right cheek. Block dissection of the glands of the neck on the right side had been carried out five weeks later. Since that time the mouth had gradually closed up. At the time of admission the patient had been able to open his mouth only 1·25 centimetres (half an inch) and consequently had been able to take nothing but fluids. The right cheek had been adherent to the upper and lower jaws as a hard mass. The skin had been adherent to the jaws and the hyoid bone and movement of the jaws very limited.

At operation Dr. Hailes had separated the jaws from the lips and cheeks. A Thiersch graft had been taken from the thigh and moulded over a wax model and sutured in the raw area after excision of the scar tissue (the Esser technique). Twelve days later the wax had come out and the graft had completely taken. Two months later the patient had been able to separate his alveolar margins 3·75 centimetres (one and a half inches) and had been able to eat anything. There was a complete gingivo-labial sulcus at the side of the maxilla and a sulcus, not so complete, at the side of the mandible.

Cerebral Endothelioma.

Dr. Hailes's third patient was a man, aged forty-seven years. Two and a half years previously he had jumped from a parapet and struck his head, causing concussion. X ray examination had revealed a vertical fracture of the left temporal bone, extending into the base. He had been sent to the Alfred Hospital and then to Caulfield. Six weeks later he had resumed work. There was no history of headaches, but since the accident his left leg had become weaker and slightly stiff. He had had thirty Jacksonian fits, starting ten weeks after the accident. The fits had been all of the same nature. When a fit was about to take place, the patient experienced a horrible, maddening feeling running from the left knee to the foot. After this his toes became clenched and then he felt tightened up all over. He then trembled first at the knee and then all over the body. He felt as if he were going round at a terrific speed and lost consciousness half a minute after the onset. After the fit his left foot and leg remained stiff for several days. He did not bite his tongue or micturate during a fit.

Examination of the central nervous system had revealed no abnormality in cerebrum, cerebellum or cranial nerves. In the spinal cord no abnormality had been detected in the posterior columns or in the spino-thalamic tracts. On examination of the pyramidal tracts it had been found that the left leg was weaker than the right, that the left leg was spastic after attacks and that the knee jerk was increased. The biceps, triceps and supinator reflexes had been normal on both sides. The right knee jerk had been normal and the left hyperactive. Ankle jerks had not been elicited. The plantar reflex had been flexor in type on both sides. The superficial abdominal and cremasteric reflexes had been active on the right side and absent on the left. No increase in cells or in globulin had been found in the cerebro-spinal fluid. No reaction had occurred to the Wassermann test. The ocular fundi had been normal.

At operation an osteoplastic flap had been turned down over the right Rolandic area. A tumour had been found in the upper part of the Rolandic area and removed; it had measured 3·0 by 2·5 by 2·0 centimetres. The dura had been loosely drawn together and the bone replaced. The pathologist had reported that the tumour was an endothelioma. After operation there had been good movement in the left arm and leg, but the left leg was ataxic. Sensation was normal, except for the loss of sense of position in the left leg. Deep X ray therapy was being used.

Injury to the Brachial Plexus.

Dr. Hailes also showed a male patient, aged thirty-five years, who had been admitted to hospital in October, 1928. While riding a motor cycle home from work, he had collided with a tram. He had been unconscious. He had subsequently lost power in the right arm and had complained of tingling and numbness in the thumb and first finger of the right hand and also of stiffness and soreness in the neck and the left shoulder. On examination the patient had been unable to abduct, rotate or adduct the right shoulder. He had not been able to flex or extend the right elbow. At the right wrist there had been moderately good flexion, but poor dorsiflexion, abduction and adduction. Flexion of the fingers had been moderately good and extension less good. There had been a loss of sensation in the areas supplied by the fifth, sixth and seventh right cervical nerves; the reaction of degeneration had been noted in the biceps, triceps and deltoid muscles. The arm had been put on an abduction splint.

In the out-patient department the patient had manifested gradual improvement. The biceps and deltoid had been the last muscles to show return of power. Dr. Hailes said that it appeared that with conservative treatment alone recovery would be complete, in spite of the fact that it had been twelve months before any return of function had taken place. In the last three months recovery had been rapid and all the muscles manifested normal electrical reactions.

Enchondroma.

Dr. Hailes showed a male patient, aged forty-two years, who had complained of having pain in the little finger for eight days. There was no history of injury. On examination there had been a swelling of the finger with definite bruising over the distal interphalangeal joint. Crepitus and tenderness had been present over the proximal phalanx. X ray examination had revealed a pathological factor through an enchondroma. At operation the enchondroma, found on subsequent examination to be typical, had been removed.

Dr. Hailes also showed a man, aged nineteen years, who had hit his second left metacarpal bone with a hammer two weeks previously. The whole hand had subsequently become swollen for from three to four days and when the general swelling had subsided, there had remained a hard, painless tumour. On admission, examination had revealed on the second metacarpal bone a rounded sessile tumour, situated about 2·5 centimetres (one inch) from the head of the bone. The skin had been movable over it, the tumour being attached to and blending with the bone. No enlarged glands had been palpable. X ray examination had revealed a typical enchondroma of the head of the second metacarpal bone. At operation the tumour had been removed and the diagnosis confirmed on microscopical examination.

Loose Bodies in the Elbow Joint.

Dr. Hailes's last patient was a man, aged twenty-one years, who gave a history that he had sprained his right elbow seven years previously. He had been examined with X rays at the Melbourne Hospital and no abnormality had been detected. Since then he had gradually lost the power of extension until he had found it impossible to extend his arm beyond the half-way position. Supination, flexion and pronation had been slightly impaired. X ray examination had revealed the presence of several loose bodies in the olecranon fossa and one in the radial fossa. At operation a medial dorsal incision had been made through the tendon of the triceps and five pieces of bony material extracted from the joint. A second incision had been made on the volar aspect to the radial side and after separation of the muscles and division of the inter-

muscular septum a smaller loose body had been extracted from the radial fossa on the front of the lower end of the humerus.

Cranial Bone Grafts.

DR. A. E. COATES showed two patients in whom defects in the skull following extensive decompression had been repaired by rib grafts.

The first patient was a male, aged thirty years, who fifteen months previously had sustained a depressed fracture of the right frontal and parietal bones with lacerations of the *dura mater* and loss of some brain substance.

On admission to hospital he had been in a condition of severe cerebral irritation with a hemiplegia and hemianæsthesia of the left side including the face. After removal of the comminuted fragments of bone and cleaning up of the wound, the lacerated brain had been allowed to herniate through a large hole in the skull. In three months the only evidence of the injury had been the defect in the skull and slight dragging of the left foot on walking and astereognosis between left thumb and index finger.

Fourteen days previously the gap in the skull had been filled by split rib cut from a suitable part of the chest to conform to the contour of the skull. Smaller areas of the defect had been filled in with strips of costal cartilage. The rib and cartilage had been anchored to the skull on its external surface by kangaroo tendon passed through it and the pericranium.

The second patient was a woman, aged forty-five, who had suffered from a depressed fracture of the frontal bone in February, 1930, involving both frontal sinuses and the orbital plate on the left side. The comminuted fragments had been removed, exposing a lacerated *dura mater* and bruised frontal pole of the brain. The residual defect had been filled by rib from the lateral thoracic wall, cut to conform to the contour of the orbital margin. The rib had been well covered by the skin of the forehead, but some misgivings had been felt regarding its fate, as the frontal sinus on the right side opened into the area occupied by the rib.

DR. R. C. BROWN remarked that he had had a similar case and that a small sequestrum had eventually come away from the affected area, but the result was not impaired.

Ulcer of the Leg.

Dr. Coates also showed two women, aged forty and forty-four, who were suffering from ulceration of the leg. One large ulcer on the lower half of the leg had been present for four years and the other patient had an ulcer of two years' duration. The usual treatment had been persisted in, namely, Unna's paste, and in one a skin graft had been applied; it had taken, but later had broken down.

As no benefit resulted from the above mentioned treatment, injection of the sheath of the femoral artery with alcohol had been tried three months previously. The improvement in the condition of the legs was considerable and the ulcers which were originally the size of the palm of the hand, had in both cases almost completely healed. The operation had been performed under local anæsthesia and the patients were treated as ambulatory from the beginning. One of the patients was gratified because of the freedom from pain in the ulcer since the femoral artery had been injected.

Compound Fractures.

Several patients with compound fracture of the tibia and fibula were shown, illustrating the use of plaster of Paris applied above and below the fracture leaving a skeleton of strips of metal at the fracture site. The limb was thus immobilized, yet the advantages of the skeleton splint were available for dressing the wound.

Obscure Neurological Condition.

DR. H. F. MAUDSLEY showed a patient, aged twenty-five years, a labourer, who had had an internal strabismus on the right side since he was a child. Otherwise he had been perfectly healthy until the occurrence of an accident seven months previously. At this time, while working in a shaft, a pickaxe had fallen on his head. He had not been rendered unconscious, though he reported sick and was off work for several days or so. He had then returned to his work, but a month after his injury he had begun to suffer from headaches and to notice a dimness in his vision. There had been no subjective visual sensations.

The headaches and dimness of vision had continued, the latter being progressive. There was no vertigo nor ataxia, nor was there any muscular weakness. Slight pallor of the optic discs was noticed one month before. The reflexes were normal in type and no other abnormal physical signs could be found. The Wassermann test applied to the blood serum gave no reaction. At the time of the meeting both discs were moderately atrophic. The visual fields showed a certain amount of general contraction with almost complete absence of the upper half of both visual fields. No abnormal neurological signs could otherwise be found.

Dr. Maudsley said that the diagnosis of this case was somewhat obscure. The symptoms appeared to be from the accident that occurred seven months previously. The possibility of a chronic subdural hæmorrhage in the region of the occipital lobe might have to be considered in view of the history of the injury. The upper quadrant of the field was represented in the lingual lobe which lay below the calcarine fissure, and it was unlikely that such a condition as a hæmatoma or a tumour would give rise to such gross visual defect without causing other localizing signs or symptoms.

A pituitary tumour might be considered possible, but an X ray examination of the pituitary fossa had revealed no deviation from the normal. Disseminated sclerosis was the most common cause of optic atrophy in young adults. This diagnosis had to be seriously considered, notwithstanding the absence of any other neurological signs. A condition that might be worthy of possible consideration in this case was one of *encephalitis periaxialis diffusa* (Schilder's disease).

A macroscopical section of brain in a case of Schilder's disease was shown. This case had been reported as a case of Schilder's disease at the meeting in 1928. The grave gelatinous area of demyelinization could be seen extending forwards from the occipital lobe. The later manifestations of Schilder's disease showed themselves as a progressive paraplegia, depending upon the form of advance of the demyelinization process.

The diagnosis of Schilder's disease in this case was a remote one, but should not be overlooked.

(To be continued.)

NOMINATIONS AND ELECTIONS.

THE undermentioned have been nominated for election as members of the New South Wales Branch of the British Medical Association:

Hardman, Robert Roderick, M.B., 1900 (Univ. Sydney), New South Wales Government Mental Hospital, Rabbit Island, *viâ* Brooklyn.

Cramp, John Francis, M.B., B.S., 1925 (Univ. Adelaide), 7, Grafton Street, Woollahra.

The undermentioned have been elected members of the New South Wales Branch of the British Medical Association:

Smith, William Frederick, M.B., B.S., 1927 (Univ. Sydney), Firth Street, Arncliffe.

Walker, Norman Arthur, M.B., 1929 (Univ. Sydney), 78, Shirley Road, Wollstonecraft.

Obituary.

HENRY L'ESTRANGE.

WE regret to announce the death of Dr. Henry L'Estrange which occurred at Brisbane, on July 10, 1930.

RUPERT GEORGE ST. JOHN NAYLOR.

We regret to announce the death of Dr. Rupert George St. John Naylor which occurred at Beechworth, Victoria, on July 3, 1930.

VISIT OF PROFESSOR J. T. WILSON.

Graduates in medicine of the University of Sydney will be pleased to hear of the return to Australia of Professor J. T. Wilson on a short visit. Dr. W. G. Armstrong, the senior graduate in medicine of the University of Sydney, presided at a preliminary meeting and a committee has been formed with a view to arranging a function at which Professor Wilson's old students will have an opportunity of meeting him again. Dr. J. G. Hunter is Honorary Secretary of the committee; a further announcement will be made.

NOTICE.

The Post-Graduate Committee of the New South Wales Branch of the British Medical Association has, by courtesy of the Melbourne Permanent Committee for Post-Graduate Work, been able to arrange for Professor Evarts Graham to deliver two lectures in Sydney on July 28 and 30, 1930. The lectures will be delivered at 8 p.m. at the British Medical Association House, 135, Macquarie Street, Sydney. The fee for the two lectures will be one guinea; resident medical officers of hospitals will pay half a guinea.

RADIUM TREATMENT.

The radium purchased by the University of Sydney has now arrived in Sydney and will be available shortly for use in the treatment of patients. At the meeting of the Senate held on July 7, 1930, approval was given to the following recommendation of the Cancer Research Committee:

> That authority be given for the hire of radium owned by the University of Sydney to approved medical practitioners under conditions later to be approved by the Senate.

Although the conditions under which radium will be hired to medical practitioners for use on private patients, have not yet received approval, the proposal has been put forward that radium should be leased only to medical practitioners who hold the qualifications suggested by the Federal Department of Health in connexion with this matter. One category reads:

> Medical practitioners who hold a recognized Australian or British diploma in radiology or who have attended a recognized post-graduate course in radium therapy.

A post-graduate course in radium therapy is now being given at the University of Sydney.

Diary for the Month.

July 22.—New South Wales Branch, B.M.A.: Medical Politics Committee.
July 22.—Queensland Branch, B.M.A.: Obstetrical Section.
July 23.—Victorian Branch, B.M.A.: Council.
July 25.—Queensland Branch, B.M.A.: Council.
July 31.—New South Wales Branch, B.M.A.: Branch.
July 31.—South Australian Branch, B.M.A.: Branch.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser," page xvi.

Director-General of Public Health, Sydney, New South Wales: Honorary Medical Officers.
Julia Creek Provisional Hospital Committee, Queensland: Medical Officer.
Toowoomba Hospitals Board, Queensland: Resident Medical Officer.

Medical Appointments: Important Notice.

Medical practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCH.	APPOINTMENTS.
New South Wales: Honorary Secretary, 21, Elizabeth Street, Sydney.	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company, Limited. Phœnix Mutual Provident Society.
Victorian: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
Queensland: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	Members accepting apopintments as medical officers of country hospitals in Queensland are advised to submit a copy of their agreement to the Council before signing. Brisbane United Friendly Society Institute. Mount Isa Hospital.
South Australian: Secretary, 207, North Terrace, Adelaide.	All Lodge Appointments in South Australia. All Contract Practice Appointments in South Australia.
Western Australian: Honorary Secretary, 65, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.
New Zealand (Wellington Division): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington, New Zealand.

Editorial Notices.

Manuscripts forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to The Medical Journal of Australia alone, unless the contrary be stated.

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